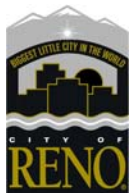


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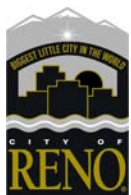
## Section 100 – General Surface Improvements

<b>DETAIL No.</b>	<b>DESCRIPTION</b>	<b>Revised Date</b>
R-101A	Roadway Sections	1/2013
R-101B	Notes – Roadway Sections	1/2013
R-102	Temporary Access Facility	1/2013
R-103	Typical Utility Main Location	1/2013
R-104A	Sidewalk Detail	1/2013
R-104B	Colored and Stamped P.C.C. Sidewalk	9/2013
R-104C	Colored and Stamped P.C.C. Pedestrian Ramp	9/2013
R-104D	Colored and Stamped P.C.C. Crosswalk	9/2013
R-104E	“Brickform Raeco” Typical Ashlar Slate Stamp Pattern Dimensions	9/2013
R-104F	General Notes colored and Stamped Concrete Sidewalks/ Driveways/Ped-Ramps/Crosswalks	9/2013
R-104G	Test Section Colored and Stamped Concrete Sidewalks/ Driveways/Ped-Ramps/Crosswalks	9/2013
R-104H	Integrally Colored and Stamped Concrete Sidewalks/ Driveways/Ped-Ramps/Crosswalks	9/2013
R-104I	Expansion and Control Jointing Colored and Stamped Concrete Sidewalks/Driveways/Ped Ramps/Crosswalks	9/2013
R-105	Sidewalk Cross-Drain	1/2013
R-106A	Pedestrian Ramp Existing Sidewalks	1/2013
R-106B	Pedestrian Ramp Narrow Sidewalks	1/2013
R-106C	Pedestrian Ramp Wide Sidewalks	1/2013
R-106D	Pedestrian Ramp Midblock-Type 1	1/2013
R-106E	Pedestrian Ramp Midblock-Type 2	1/2013
R-106F	Pedestrian Ramp Details	1/2013
R-106G	Notes – Pedestrian Ramp	1/2013
R-107	P.C.C. Valley Gutter	1/2013
R-108	Longitudinal P.C.C. Valley Gutter	1/2013
R-109	P.C.C. Curb & Gutter	1/2013
R-110	P.C.C. Median Curb	12/2014
R-112	Curb Opening	1/2013
R-113	Storm Drain Inlet Protection	1/2013
R-114A	P.C.C. Driveway Apron	1/2013
R-114B	Notes – P.C.C. Driveway Apron	3/2014



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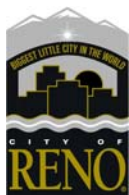
R-115A	Driveway Geometrics	1/2013
R-115B	Driveway Geometrics	1/2013
R-116A	P.C.C. Alley	1/2013
R-116B	Notes – P.C.C. Alley	1/2013
R-117	Sidewalk Plate for Tree Root Clearance	1/2013
R-119A	Concrete Pavement Patch	8/2014
R-119B	Details – Concrete Pavement Patch	8/2014
R-119C	Notes – Concrete Pavement Patch	8/2014
R-120	Permanent Bituminous Pavement Patch	1/2013
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R-122	Trench Excavation /Backfill	3/2014
R-124	Monuments	1/2013



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## Section 200 – Sewer /Storm Drain Improvements

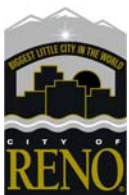
<b>DETAIL No.</b>	<b>DESCRIPTION</b>	<b>Revised Date</b>
R-201	Lot Line Drainage Swale	1/2013
R-202	Major Drainage Channel	1/2013
R-203	Yard Drain	1/2013
R-204	Water / Sewer Separation	8/2014
R-205	Catch Basin Type 3-R	1/2013
R-206A	Catch Basin Type 4-R	1/2013
R-206B	Notes – Catch Basin Type 4-R	1/2013
R-207	High Capacity Curb Inlet	1/2013
R-208A	Manhole Type I	1/2013
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R-208C	Notes – Manhole Type I & Type V	4/2014
R-209	Manhole – Outside Drop	1/2013
R-213	Catch Basin Oil / Water Separator	1/2013
R-214A	24” Manhole Frame & Cover	4/2015
R-214B	36” Manhole Frame with 24” Cover Adaptor	3/2014
R-214C	Temporary Manhole Cover	1/2013
R-218A	Manhole Collar	1/2013
R-218B	Manhole Collar Easement Areas	1/2013
R-223A	Sanitary Sewer to Manhole Connection	4/2014
R-223B	Storm Drain Pipe to Manhole Connection	4/2014
R-223C	Resilient Flexible Connector	4/2014
R-224A	Sanitary Sewer Lateral	1/2013
R-224B	Notes – Sanitary Sewer Lateral	1/2013
R-224C	Sanitary Sewer Tap Saddle	1/2013
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R-227	Storm Drain Access Roads (For Hillside Development)	1/2013



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R-301B	Notes – Fire Hydrant	10/2014
R-301C	Notes – Fire Hydrant	10/2014
R-302	Fire Hydrant Marker Locations	1/2013

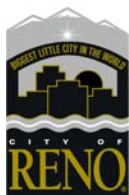




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## **Section 400 – Traffic Control Improvements**

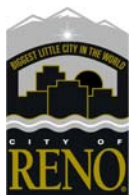
<b>DETAIL No.</b>	<b>DESCRIPTION</b>	<b>Revised Date</b>
R-401	Street Name Sign	7/2013
R-402A	Emergency Access Control Gate	1/2013
R-402B	Emergency Access Control Gate	1/2013
R-402C	Emergency Access Control Gate	1/2013
R-403A	Speed Bump Layout, Signage, & Striping	1/2013
R-403B	Speed Bump Cross Sections	1/2013
R-403C	Notes and Speed Bump Joint Details	1/2013
R-404	Traffic & Lighting Conduit Trench	1/2013
R-406A	Loop Detector Layout	8/2014
R-406B	Notes – Loop Detector Layout	8/2014
R-407	Parking Space Markings	3/2014
R-413A	Traffic Signal Pole and Equipment	1/2013
R-413B	Traffic Signal Decorative Pole	1/2013
R-413C	Decorative Street Light Pole	1/2013
R-413D	Decorative Street Light Pole	3/2014
R-413E	Pole Street Name Sign	3/2014
R-413F	Notes – Traffic Signals & Poles	1/2013
R-413G	Notes – Traffic Signals & Poles	1/2013
R-413H	Notes – Traffic Signals & Poles	1/2013
R-413I	Standard Pull Box	1/2013
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R-414	Traffic Parking Signs	1/2013
R-415	Traffic Sign Installation	1/2013
R-417A	School Zone Flashers	1/2013
R-417B	Notes – School Zone Flashers	1/2013
R-418	Median Island Traffic Control	1/2013
R-420	Crosswalk Legend	1/2013

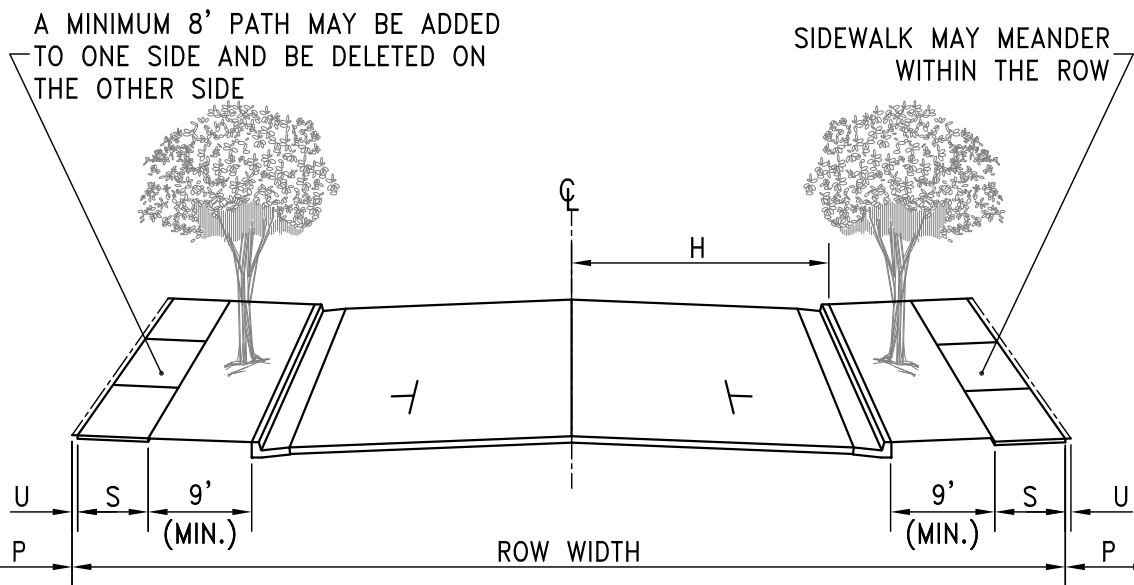
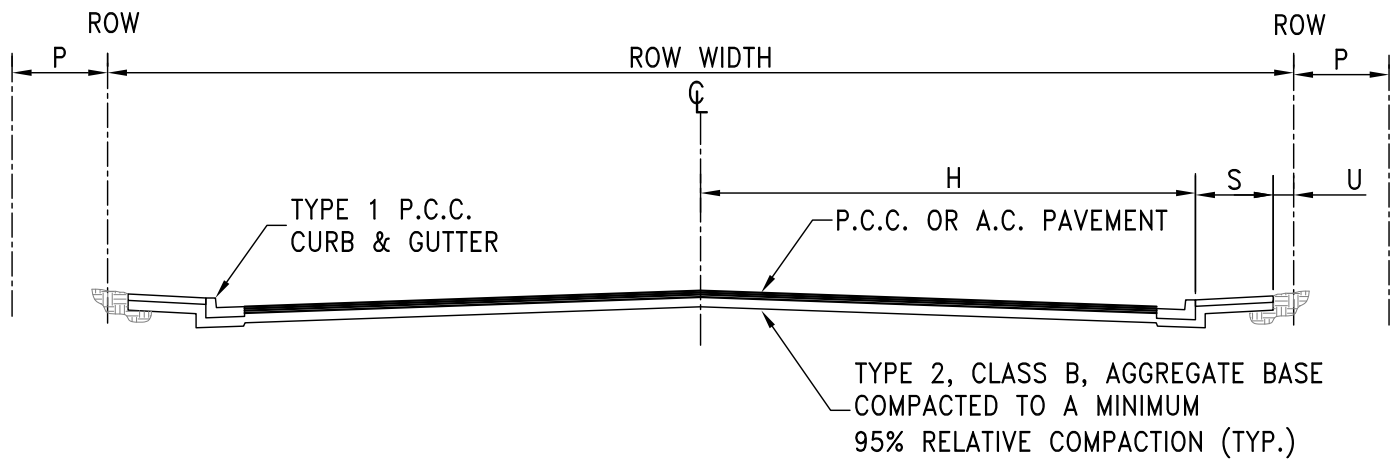
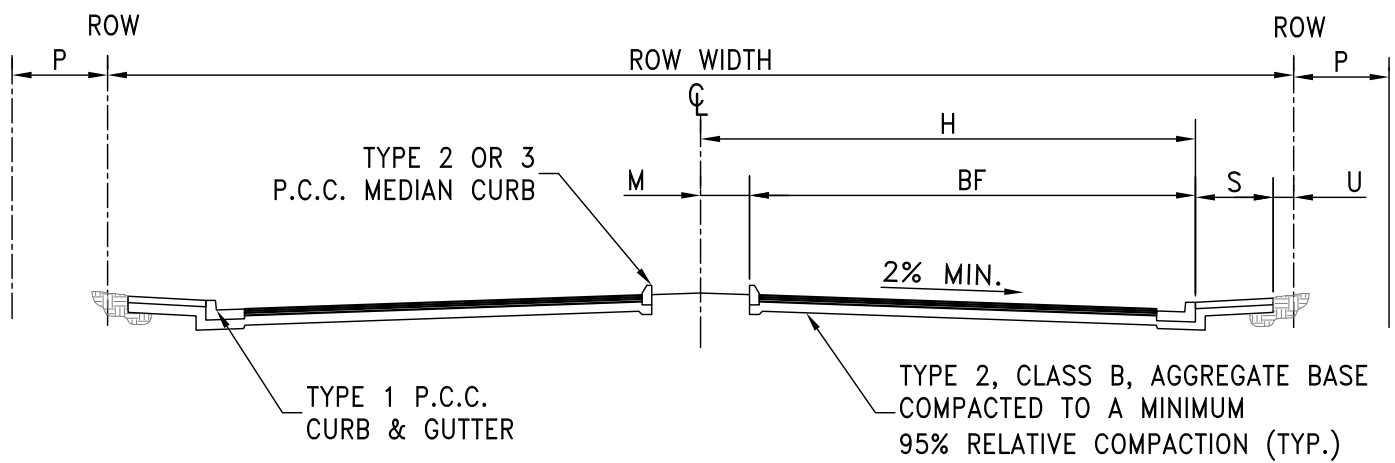


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## **Section 500 – Landscape Improvements**

<b>DETAIL No.</b>	<b>DESCRIPTION</b>	<b>Revised Date</b>
R-501	Sound Barrier	1/2013
R-502	Electronic Gate Access Box	1/2013
R-503	Removable Bollard	1/2013
R-504A	Masonry Retaining Walls I – L&S	1/2013
R-504B	Masonry Retaining Walls	1/2013
R-504C	Notes – Masonry Retaining Walls	1/2013
R-504D	Notes – Masonry Retaining Walls	1/2013





### WITH PARKWAY

(RESIDENTIAL COLLECTOR AND LOCAL STREETS ONLY)








STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## ROADWAY SECTIONS

DRAWING No.

R-101A

APPROVED BY: JF DATE: 1/2013

STREET CLASSIFICATION	ROW WIDTH	P 	H	BF	M	S	U	A.D.T. (MAX.)
ARTERIAL-MAJOR	102 	7.5	44.5	37	7.5	6	0.5	----
ARTERIAL-MINOR	82 	7.5	34.5	--	--	6	0.5	30,000
COLLECTOR-COMMERCIAL	64	7.5	25.5	--	--	6	0.5	15,000
COLLECTOR-RESIDENTIAL (WITHOUT PARKWAY)	50	7.5	20.5	--	--	4	0.5	8,000 
COLLECTOR-RESIDENTIAL (WITH PARKWAY)	68	7.5	19.5	--	--	4	0.5	8,000 
LOCAL (WITHOUT PARKWAY)	46	7.5	17.5	--	--	4	0.5	1,000
LOCAL (WITH PARKWAY)	64	7.5	17.5	--	--	4	0.5	1,000

ALL UNITS IN TABLE ARE IN FEET UNLESS OTHERWISE NOTED.

ABBREVIATIONS:

A.D.T AVERAGE DAILY TRAFFIC

ROW RIGHT OF WAY WIDTH

 CENTERLINE OF ROW

P PRIVATE UTILITY EASEMENT WIDTH

H HALF STREET WIDTH (BACK FACE OF CURB TO CENTERLINE OF ROW)

M MEDIAN ISLAND WIDTH

BF HALF STREET WIDTH WITH MEDIAN ISLAND (BACK FACE OF CURB TO BACK FACE OF CURB)

S SIDEWALK WIDTH


U DISTANCE FROM BACK OF SIDEWALK TO ROW

NOTES:

1. BF AND H ARE MEASURED TO THE BACK FACE OF CURB.
2. CURB & GUTTER SECTIONS SHALL BE POURED SEPARATELY FROM SIDEWALK SECTIONS.
3. STRUCTURAL SECTION TO BE DETERMINED BY ENGINEERING DESIGN BASED ON RESILIENT MODULUS TESTING, BUT IN NO CASE SHALL THE A.C. BE LESS THAN 4" OVER 6" BASE.

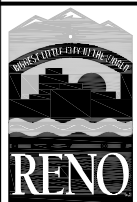
 ADDITIONAL ROW MAY BE REQUIRED ON ARTERIAL STREETS AND AT INTERSECTIONS.

5. WIDER SIDEWALKS ARE TO BE PROVIDED WHEN REQUIRED BY THE CITY ENGINEER.

 RESIDENTIAL DRIVEWAY ACCESS SHALL NOT BE ALLOWED ON ANY STREET WHERE THE A.D.T. IS GREATER THAN 4,000.

7. REFER TO ADDITIONAL INFORMATION ON WIDTHS AND REQUIREMENTS FOR RESIDENTIAL COLLECTORS, LOCAL STREETS, ALLEYS, PERMANENT EMERGENCY ACCESS AND SHARED DRIVEWAYS AS CONTAINED IN THE CITY OF RENO'S DESIGN MANUAL.

 ADDITIONAL EASEMENTS MAY BE REQUIRED FOR CITY CONDUIT.



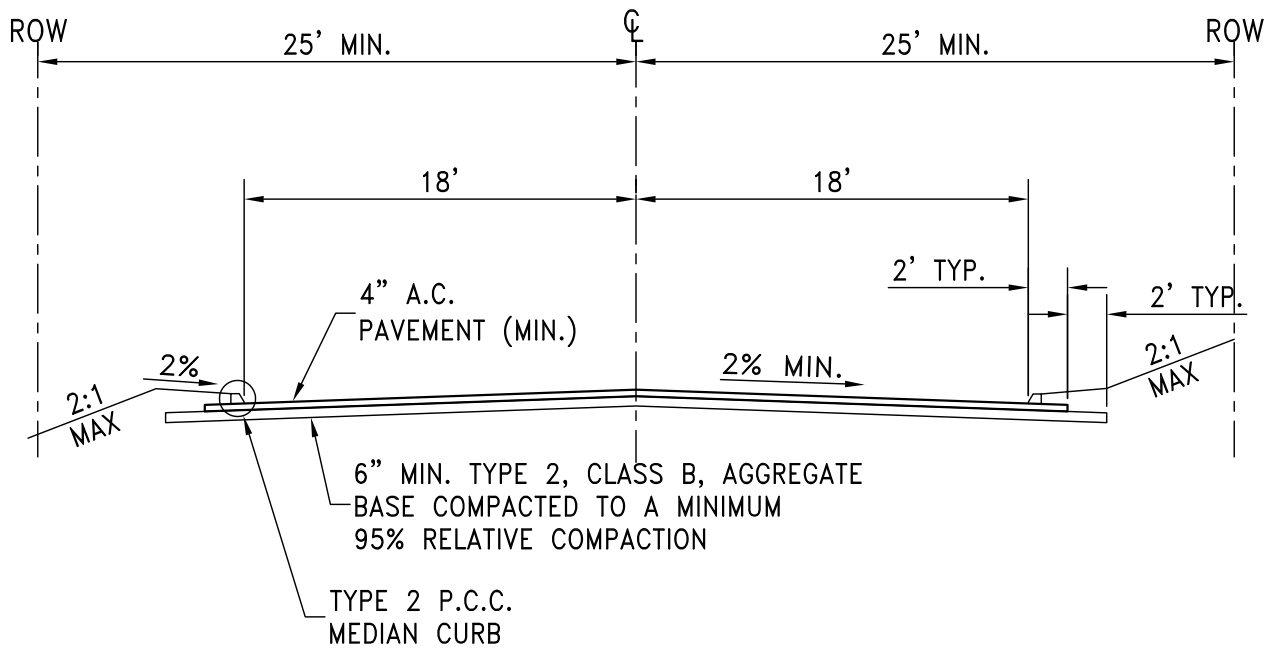
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# NOTES - ROADWAY SECTIONS

R-101B

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. TO BE USED ONLY WITH THE APPROVAL OF THE CITY ENGINEER.
2. THIS IS A TEMPORARY FACILITY AND IS ONLY ALLOWED FOR ROADWAYS DESIGNATED AS COLLECTORS OR ARTERIALS. THIS SECTION MAY BE USED THROUGH COMMERCIAL OR RESIDENTIALLY ZONED PROPERTIES TO CONNECT REMOTE DEVELOPMENTS TO EXISTING CITY STREETS.
3. ADDITIONAL ROW MAY BE REQUIRED AT INTERSECTIONS.
4. SIDEWALKS MAY BE REQUIRED IN CERTAIN LOCATIONS AND CONDITIONS.
5. PROVISIONS FOR ADEQUATE DRAINAGE FACILITES REQUIRED.



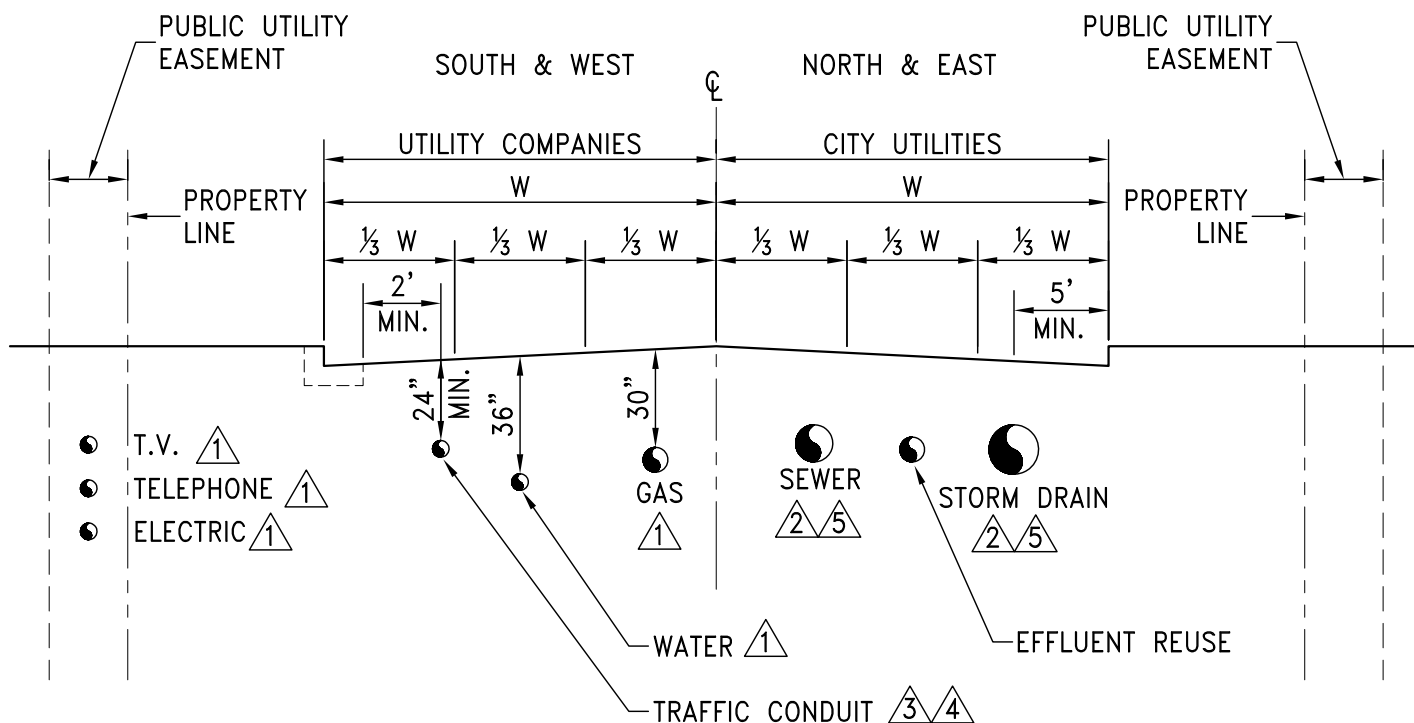
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# TEMPORARY ACCESS FACILITY

DRAWING No.

R-102

APPROVED BY: JF | DATE: 1/2013

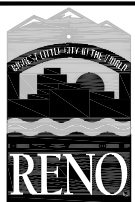


**ABBREVIATIONS:**

W = WIDTH FROM CENTERLINE (CL) OF ROADWAY TO FRONT FACE OF CURB.

**NOTES:**

1. SEE OWNING UTILITY COMPANY FOR STANDARD TRENCH SECTIONS.
2. SEE STANDARD DETAIL R-122 FOR TYPICAL SANITARY SEWER AND STORM DRAIN TRENCH SECTION.
3. SEE STANDARD DETAIL R-404 AND R-405 FOR TYPICAL TRAFFIC CONDUIT TRENCH SECTION.
4. TRAFFIC CONDUITS ARE ALLOWED TO BE PLACED ON EITHER SIDE OF THE ROADWAY PER THE DIMENSION LIMITATIONS SHOWN.
5. MINIMUM DISTANCE FROM CENTERLINES OF EITHER STORM DRAIN OR SEWER LINES TO THE FACE OF CURB IS 5 FEET.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

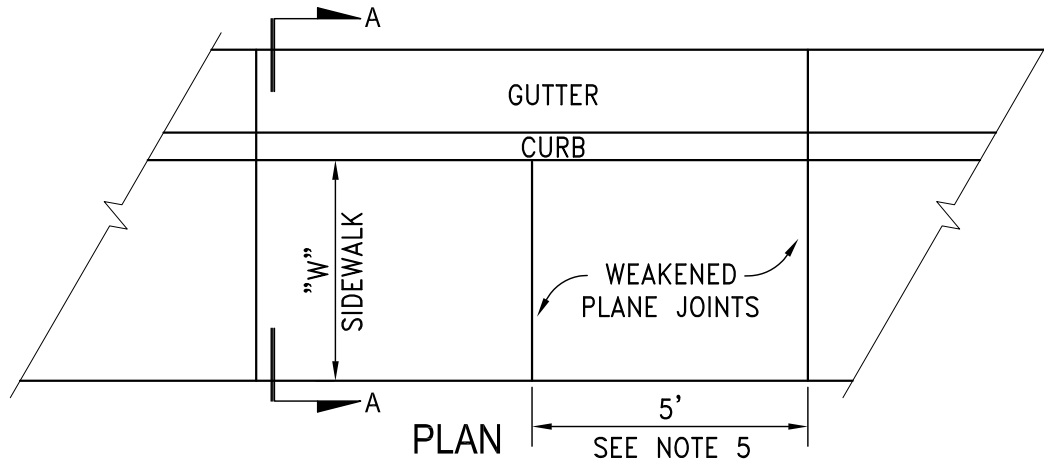
# TYPICAL UTILITY MAIN LOCATIONS

DRAWING No.

R-103

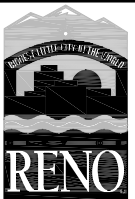
APPROVED BY: JF | DATE: 1/2013

## SECTION A-A



NOTES:

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. AGGREGATE BASE MATERIAL UNDER SIDEWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. SIDEWALK WIDTH "W" SHALL BE 4 FT MIN. ON RESIDENTIAL STREETS AND 6 FT MIN. ON COLLECTOR AND ARTERIAL STREETS.
4. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 5 FT INTERVALS AND ACCORDANCE WITH SECTION 312 OF THE SSPWC.
5. ALL ADJACENT CONCRETE REMOVAL SHALL BE TO NEAT SAW CUT LINES AT RIGHT ANGLES TO NEW SIDEWALK. DOWEL INTO EXISTING ADJACENT CONCRETE SIDEWALK WITH A MINIMUM OF TWO (2) No. 4 REINFORCEMENT BARS EQUALLY SPACED ACROSS WIDTH "W". DOWELS SHALL PENETRATE A MINIMUM OF 4" INTO EXISTING CONCRETE.
6. SIDEWALKS SHALL NOT BE POURED MONOLITHICALLY WITH CURBS.
7. COLORED CONCRETE AND PAVERS ARE NOT ALLOWED.
8. TUNNELING AND/OR BORING IS NOT ALLOWED.



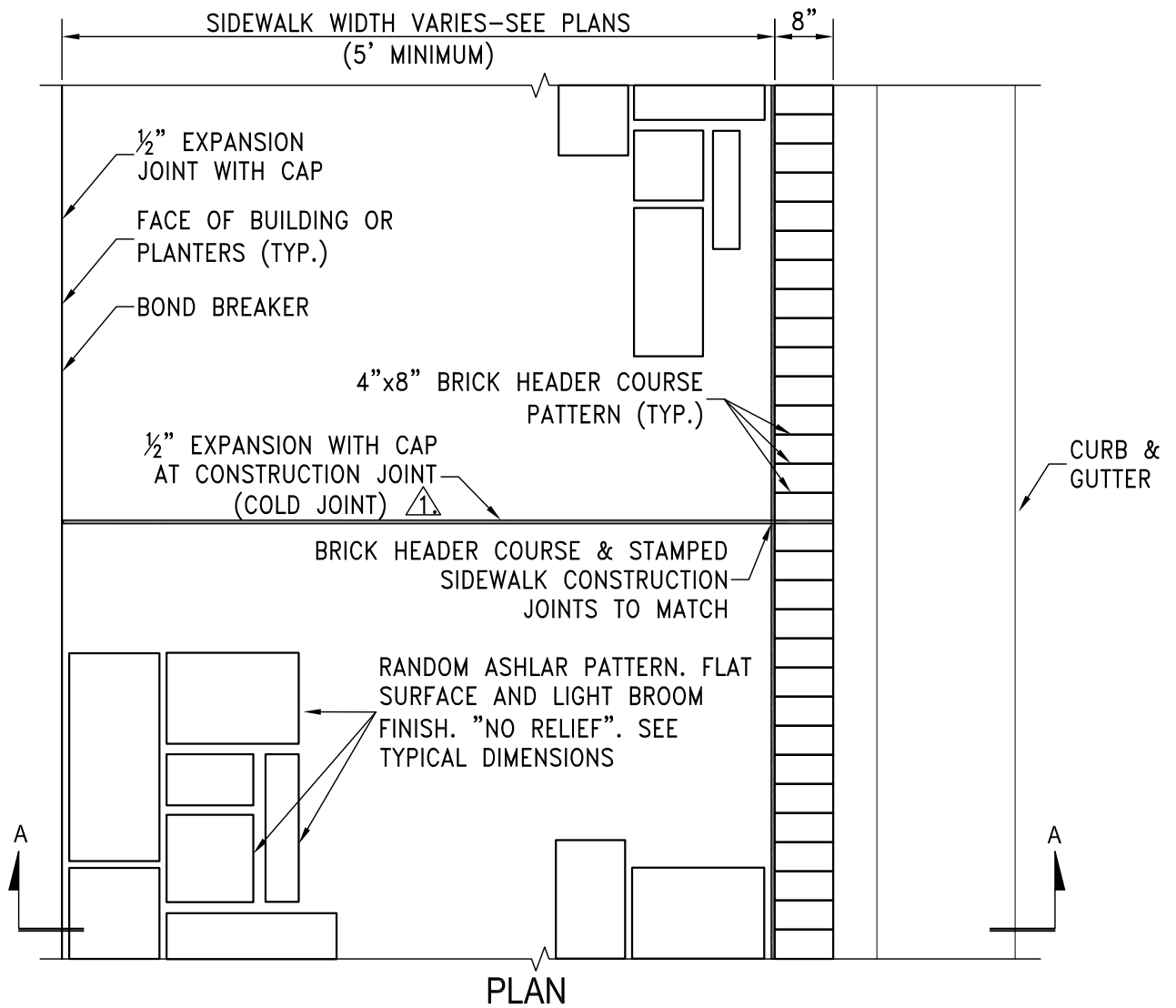
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

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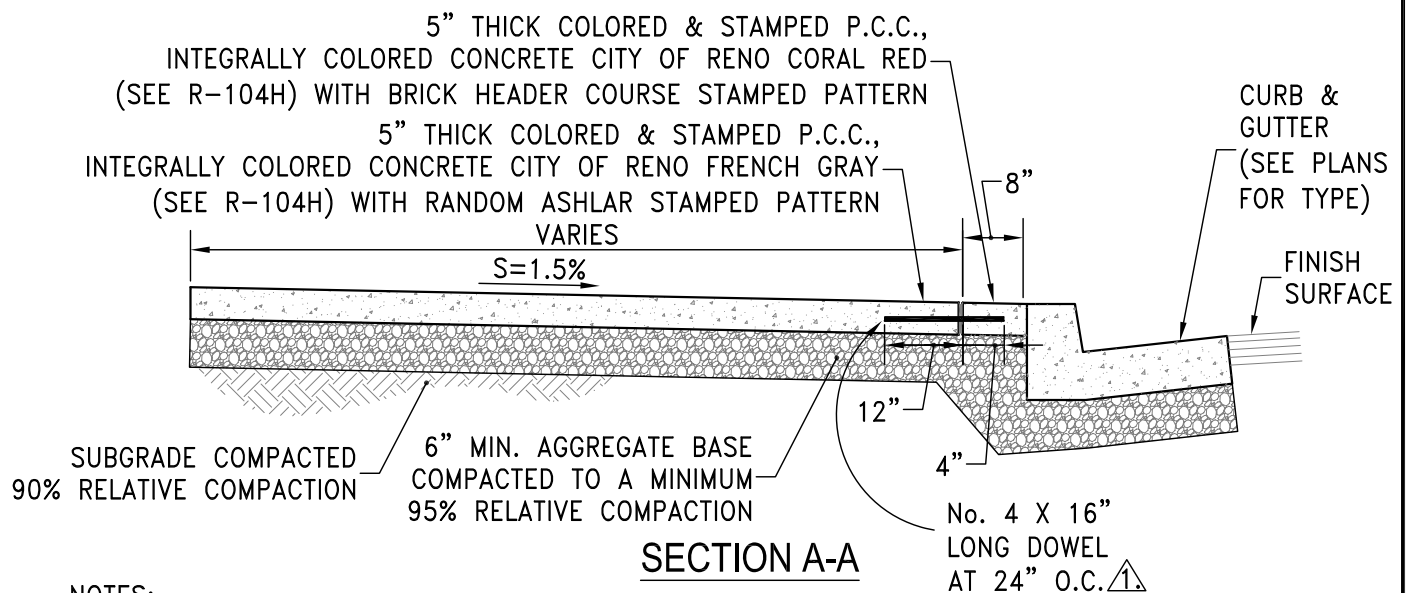
## SIDEWALK DETAIL

R-104A

APPROVED BY: JF	DATE: 1/2013
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**PLAN**



**SECTION A-A**

**NOTES:**

(1) NO DOWEL WITHIN ONE (1) FOOT OF ANY SAWCUT OR TOOL JOINT.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

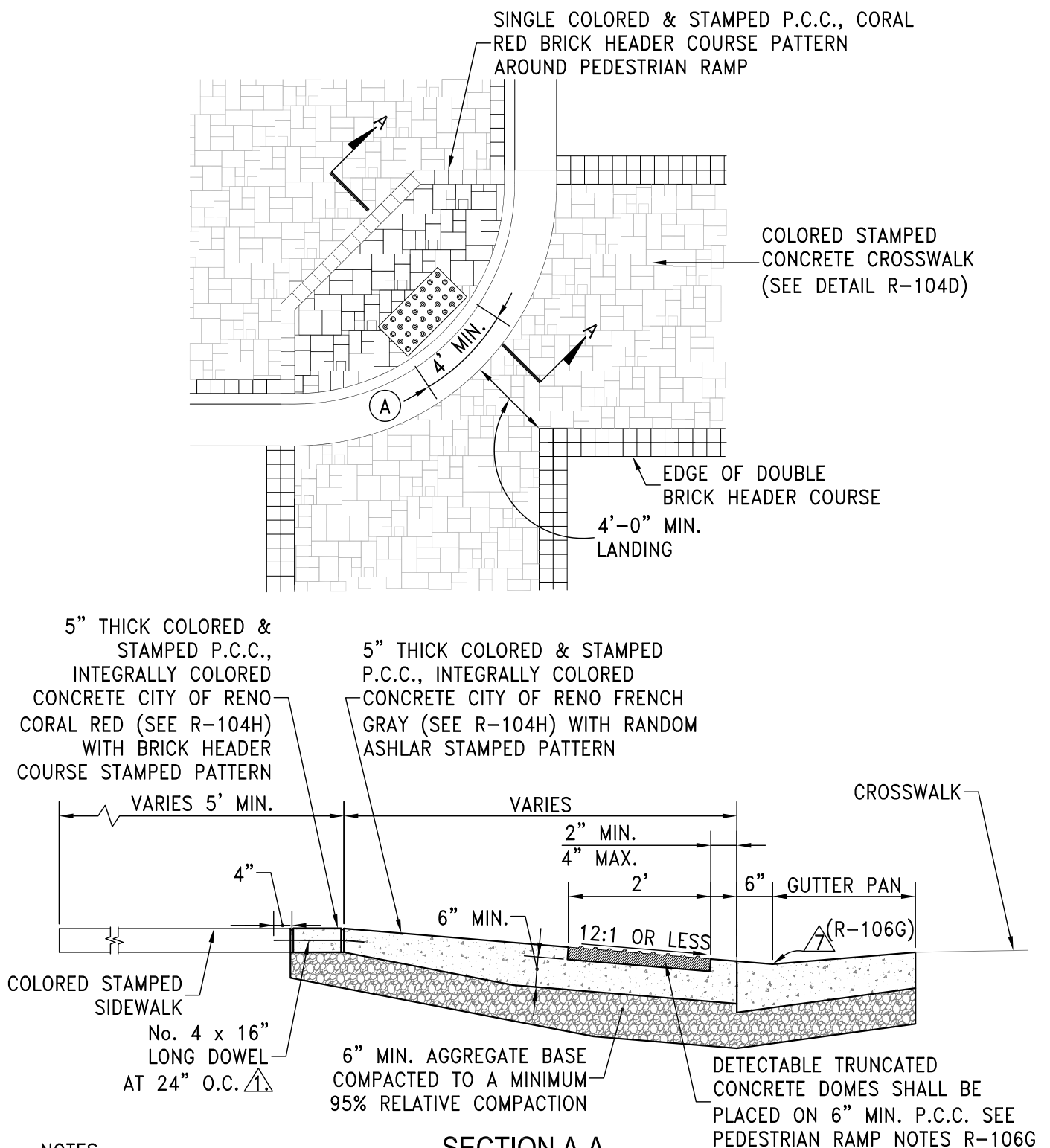
**COLORED AND STAMPED  
P.C.C. SIDEWALK**

DRAWING No.

**R-104B**

APPROVED BY: JF | DATE: 9/2013





NOTES:

(A) MINIMUM 4'-0" WIDE PEDESTRIAN RAMP OPENING SHOWN. LARGER RETURN RADIUS WILL REQUIRE LARGER OPENING. TRUNCATED DOMES SHALL EXTEND THE ENTIRE WIDTH OF THE OPENING. FOR ADDITIONAL PEDESTRIAN RAMP NOTES SEE DETAILS R-106A THROUGH R-106G

(B) FOR ADDITIONAL COLORED STAMPED CONCRETE NOTES SEE DETAILS R-104D TO R-104I

WITH NO DOWEL WITHIN ONE (1) FOOT OF ANY SAWCUT OR TOOL JOINT.



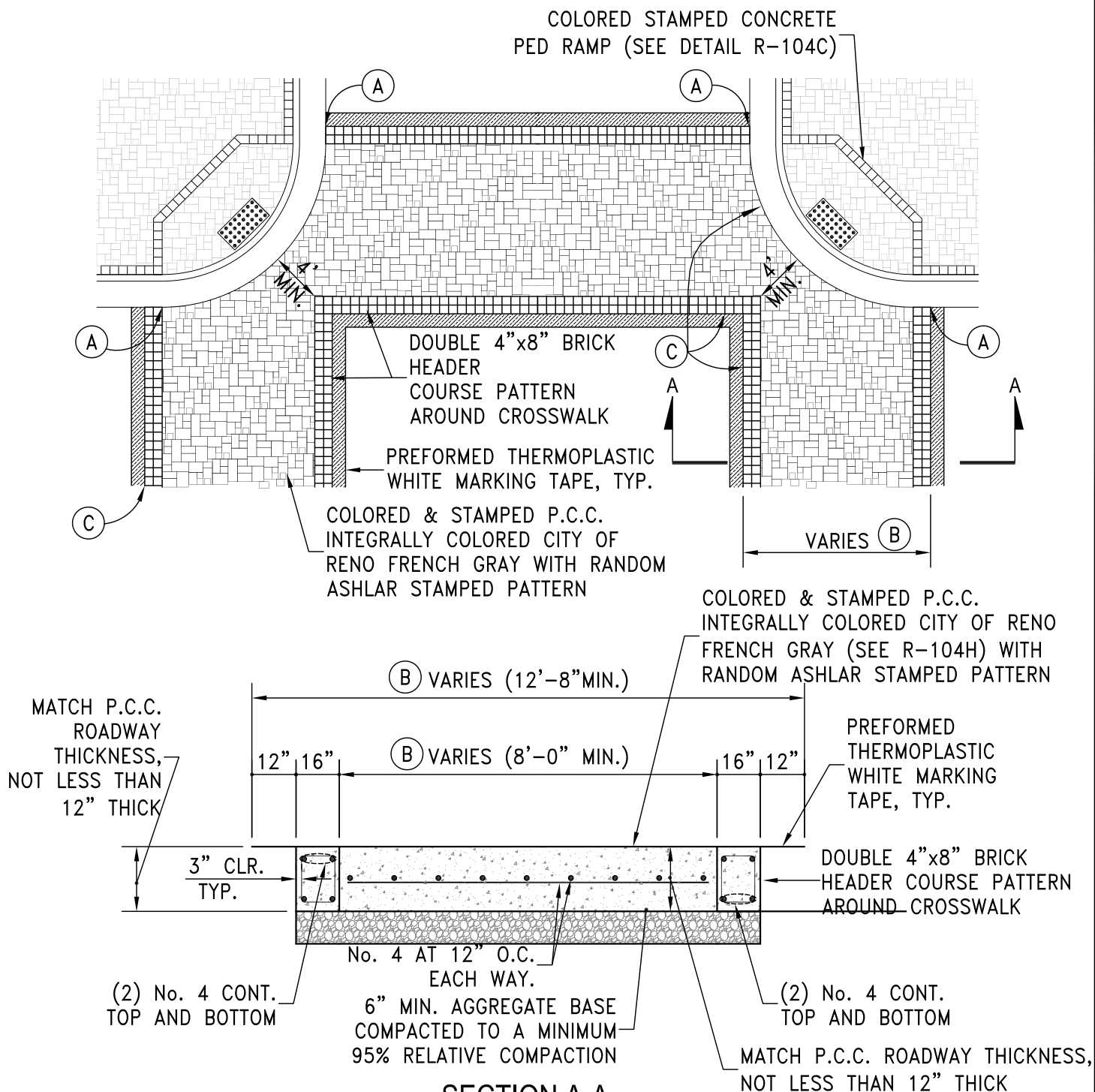
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# COLORED AND STAMPED P.C.C. PEDESTRIAN RAMP

DRAWING No.

R-104C

APPROVED BY: JF | DATE: 9/2013



NOTES:

SECTION A-A

- (A.) EDGE OF CROSSWALK (DOUBLE BRICK HEADER COURSE) TO BEGIN AT INTERSECTION CURB RETURN.
- (B.) 12'-8" MINIMUM CROSSWALK WIDTH SHOWN. CROSSWALK WIDTH WILL VARY ACCORDING TO INTERSECTION ALIGNMENT AND CURB RETURN GEOMETRY.
- (C.) 1/2" EXPANSION WITH CAP REQUIRED AT ALL LOCATIONS WHERE BRICK HEADER COURSE IS ADJACENT TO P.C.C. ROADWAY AND GUTTER LIP/TOE (NOT REQUIRED WHERE ADJACENT TO BITUMINOUS ASPHALT, SEE R-104I).



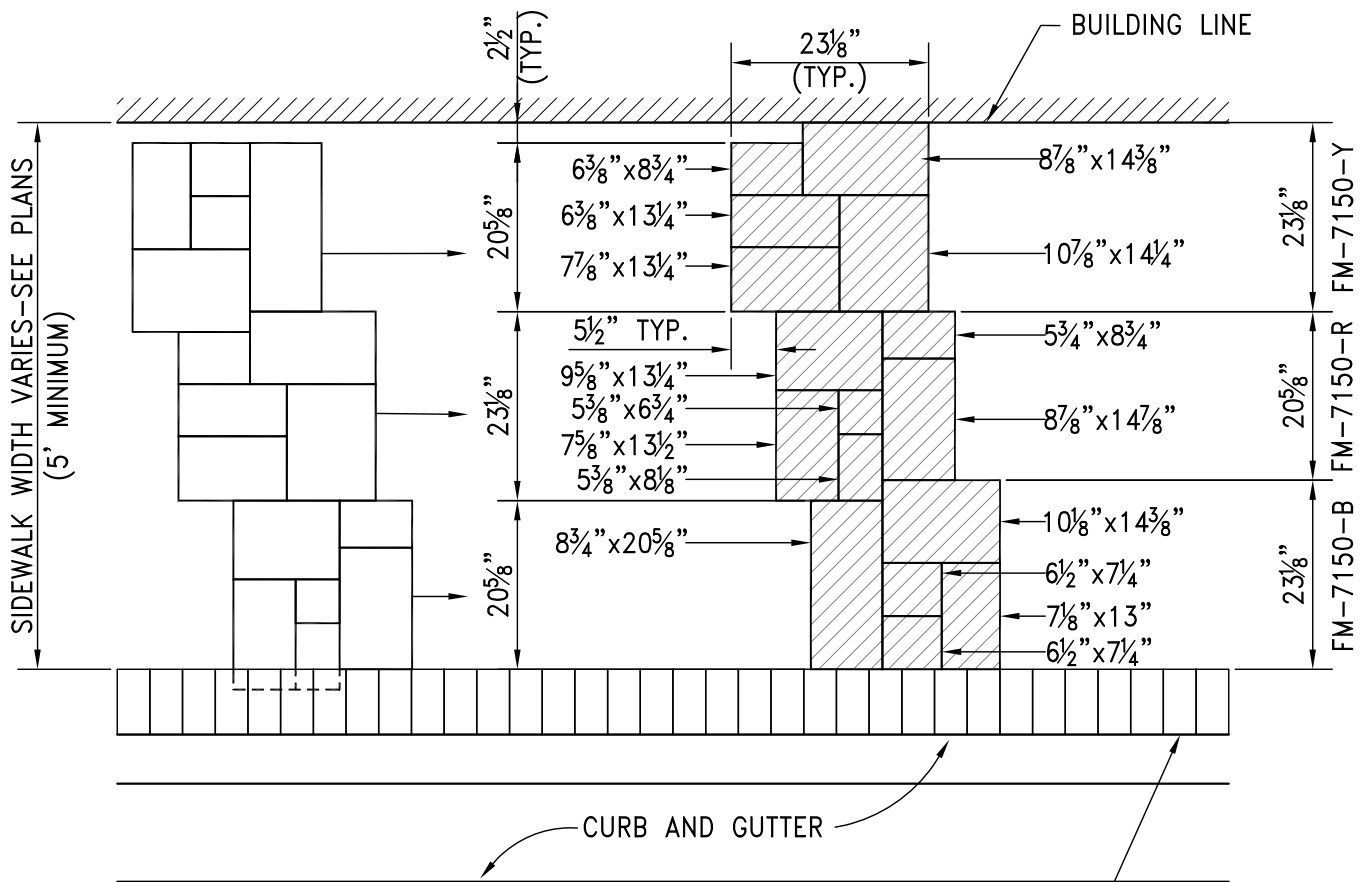
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

COLORED AND STAMPED  
P.C.C. CROSSWALK

DRAWING No.

R-104D

APPROVED BY: JF DATE: 9/2013



4" X 8" BRICK HEADER COURSE.  
(SEE PLAN FOR ACTUAL NUMBER  
OF BRICK HEADER COURSE  
REQUIRED)

#### NOTES:

- DIMENSION TOLERANCES:
  - LENGTH  $-\frac{1}{4}" \pm \frac{1}{8}"$
  - WIDTH  $-\frac{3}{8}" \pm \frac{1}{8}"$
  - DEPTH  $-\frac{1}{4}" \pm \frac{1}{8}"$
- SIZES OF DESIGN AT END/EDGE VARY AND/OR ADJUSTED TO FIT THE LENGTH AND WIDTH OF SIDEWALK, AND WILL REQUIRE HAND TOOLING.
- THE ASHLAR SLATE STAMPED PATTERN SHALL BE "BRICKFORM RAFCO" OR APPROVED EQUAL
- PATTERN DESCRIPTION: PATTERN IS FORM OF RECTANGULAR STONES IN VARIOUS SIZES LAID IN A RANDOM MANNER. THE SIDES OF THE STONES VARY FROM  $5\frac{1}{4}"$  TO  $20\frac{5}{8}"$ . EDGES ARE BEVELED FORMING A V-SHAPE GROOVE WITH THE APPEARANCE OF UNGROUTED JOINT,  $\frac{1}{2}"$  WIDE AND  $\frac{1}{4}"$  DEEP. OUTER BEVELED EDGES ARE  $\frac{1}{4}"$  WIDE WHICH MATCH THE INSIDE JOINTS WHEN STAMPS ARE JOINED. THE COMPLETED PATTERN IS FORMED BY THE USE OF 3 STAMP FORMS, B, R AND Y, EACH WITH DIFFERENT RANDOM ARRANGEMENT OF STONES.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

"BRICKFORM RAFCO" TYPICAL ASHLAR  
SLATE STAMP PATTERN DIMENSIONS

DRAWING No.

R-104E

APPROVED BY: JF DATE: 9/2013

# GENERAL NOTES - COLORED AND STAMPED CONCRETE

1. ALL SIDEWALK AND PEDESTRIAN RAMP CONCRETE SHALL BE FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) AND SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF THE STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO THE SSPWC.
2. ALL CROSSWALK CONCRETE SHALL BE DESIGNED TO ACHIEVE A 28 DAY STRENGTH SUCH THAT NOT MORE THAN FIVE PERCENT OF THE CONCRETE PRODUCED WILL FALL BELOW FLEXURAL STRENGTH OF 650 PSI. THE MIX DESIGN SHALL MEET THE REQUIREMENT OF SECTION 337.11.01 OF THE SSPWC. ALL CONCRETE SHALL BE PROTECTED FROM TRAFFIC LOADS UNTIL 550 PSI MIN FLEXURAL STRENGTH IS ACHIEVED.
3. AGGREGATE BASE MATERIAL UNDER SIDEWALKS, PEDESTRIAN RAMPS AND CROSSWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SECTION 200 OF THE SSPWC.
4. ALL ADJACENT CONCRETE REMOVAL SHALL BE TO NEAT SAW CUT LINES AT RIGHT ANGLES TO NEW SIDEWALK. DOWEL INTO EXISTING ADJACENT CONCRETE SIDEWALK WITH A MINIMUM OF TWO (2) No. 4 REINFORCEMENT BARS EQUALLY SPACED ACROSS WIDTH "W" OF SIDEWALK. DOWELS SHALL PENETRATE A MINIMUM OF 4" INTO EXISTING CONCRETE.
5. STORM DRAIN INLETS OR SIMILAR ACCESSSES SHALL NOT BE LOCATED IN THE AREA AT THE BASE OF THE CURB RAMP OR LANDING AREA. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, PULL BOXES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED, THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON APPROVAL OF THE ENGINEER.
6. DETECTABLE WARNING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SHALL BE PLACED ON MIN. SIX (6") INCHES OF P.C.C.
7. DETECTABLE WARNING SHALL CONSIST OF PRECAST WETSET TILES WITH MIN. SIZE OF 2' X 2', COLOR DARK RED. APPROVED PRODUCTS INCLUDE: "CASTinTACT", "TEKWAY DOMES-TILES", "ARMOR CAST WET SET TILES", AND "ARCIS WET SET TILES". DETECTABLE WARNING SHALL BE CONSTRUCTED PER MANUFACTURER'S INSTALLATION GUIDELINES AND CONFORM TO ADAAG.
8. GUTTER SHALL MAINTAIN POSITIVE DRAINAGE TO PREVENT PONDING.
9. ALL SLOPE RATES ARE RELATIVE TO LEVEL AND SHALL COMPLY WITH THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG) STANDARDS, CURRENT VERSION.
10. THE CONCRETE SHALL BE PLACED AND CONSOLIDATED SO AS TO COMPLETELY FILL SPACES IN THE FORMS AND TO PROVIDE SUITABLE SURFACE FOR FINISHING. THE CONCRETE ADJACENT TO THE FORMS SHALL BE SPADED. ALL SURROUNDING SURFACES OR WALLS SHALL BE PROTECTED TO PREVENT DISCOLORATION. WATER MUST NOT BE SPRAYED ON THE SURFACE TO RETEMPER THE PLASTIC CONCRETE FOR ADDITIONAL TROWELLING. HARD STEEL TROWELLING SHALL BE MINIMIZED TO AVOID TROWEL BURNS. THERE WILL BE "NO RELIEF" IN THE SURFACE OF THE CONCRETE FOR THE ASHLAR STONE RANDOM PATTERN AREAS.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**GENERAL NOTES COLORED AND STAMPED  
CONCRETE SIDEWALKS / DRIVEWAYS /  
PED RAMPS / CROSSWALKS**

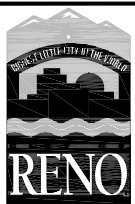
DRAWING No.

**R-104F**

APPROVED BY: JF | DATE: 9/2013

TEST SECTION:

1. THE CONTRACTOR WILL BE REQUIRED TO CONSTRUCT A TEST SECTION AT THE PROJECT LOCATION FOR THE STAMPED CONCRETE SIDEWALK.
2. THE TEST SECTION WILL CONSIST OF A PORTION OF THE FINAL SIDEWALK WORK, FULL WIDTH AND A MINIMUM LENGTH OF 10 FEET. THE ENGINEER RESERVES THE RIGHT TO INCREASE THE LENGTH OF THE TEST SECTION TO 20 FEET IF THE SITUATION WARRANTS SUCH. THE CONTRACTOR MAY CONSTRUCT THE TEST SECTION BETWEEN EXPANSION JOINTS TO BECOME A PORTION TO THE FINAL SIDEWALK WORK. THE CONTRACTOR SHALL CONSTRUCT THE TEST SECTION TO DEMONSTRATE HIS ABILITY TO SUPPLY, PLACE, CONSOLIDATE, FINISH, CURE, TEXTURE, AND SEAL STAMPED CONCRETE. THE COLOR SHALL BE UNIFORM AND CONFORM TO THE CITY OF RENO'S COLOR SCHEME. THE STAMPED LINES SHALL NOT BE SKEWED AND SHALL HAVE LINES THAT ARE CONTINUOUS ACROSS CONTRACTION AND EXPANSION JOINTS.
3. FOR ACCURATE COLOR, THE QUANTITY OF CONCRETE MIXED TO PRODUCE THE SAMPLE SHALL NOT BE LESS THAN 3 YD<sup>3</sup> AND SHOULD BE IN FULL CUBIC YARD INCREMENTS. BATCH TICKETS SHALL INCLUDE A COMPLETE BREAK OUT OF ALL MATERIALS AND WEIGHTS FOR EACH.
4. ONCE ACCEPTED BY THE ENGINEER, THIS TEST SECTION SHALL REMAIN THROUGH THE COMPLETION OF THE WORK AND WILL BE A QUALITY STANDARD FOR JUDGING THE REMAINDER TO THE WORK. THE CONTRACTOR SHALL NOT COMMENCE WORK ON THE REMAINDER OF ANY OF THE STAMPED CONCRETE UNTIL THE TEST SECTION HAS BEEN COMPLETED AND ACCEPTED BY THE ENGINEER. THE CONTRACTOR MAY BE REQUIRED TO CONSTRUCT ADDITIONAL STAMPED CONCRETE TEST SECTIONS, IF THE INITIAL TEST SECTION IS NOT ACCEPTABLE. ALL STAMPED CONCRETE PLACED IN THE FINAL WORK SHALL BE ACCEPTED BASED ON THE CONTRACTOR'S ABILITY TO PRODUCE THE SAME QUALITY AS THAT SHOWN IN THE TEST SECTION AND IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS AND THESE SPECIAL PROVISIONS.
5. AREAS NOT HAVING UNIFORM COLOR, STAMPING, OR OTHER SPECIFIED REQUIREMENTS SHALL BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

TEST SECTION COLORED AND STAMPED  
CONCRETE SIDEWALKS / DRIVEWAYS /  
PED RAMPS / CROSSWALKS

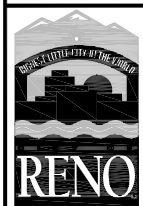
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R-104G

APPROVED BY: JF | DATE: 9/2013

## INTEGRALLY COLORED AND STAMPED CONCRETE:

1. COLORS SHALL MATCH THE EXISTING COLORS ON VIRGINIA ST. (WEST SIDE) AND W. FIRST ST.  
CORAL RED – BRICK HEADER COURSE  
FRENCH GRAY – ASHLAR STAMPED
2. CONTRACTOR IS RESPONSIBLE FOR COLOR MATCH AND PROVIDING A TEST SECTION PER DETAIL R-104G. RECENTLY ACCEPTED COLORS (OR APPROVED EQUAL):  
INCRETE SYSTEMS POWDER COLOR DARK GRAY (4 LBS PER SACK) – MATCH FRENCH GRAY  
INCRETE SYSTEMS POWDER COLOR BRICK RED (4 LBS PER SACK) – MATCH CORAL RED
3. INTEGRAL COLORS SHALL MEET REQUIREMENTS OF ASTM C979.
4. LIQUID RELEASE SHALL CONSIST OF 100% MINERAL SPIRITS. THE SURFACE SHALL BE BROOM FINISHED (LIGHT) AND HAVE A FLAT SURFACE FINISH.
5. CURING AND SEALING SYSTEM SHALL BE A SOLVENT BASED, NON-YELLOWING, VOC COMPLIANT COMPOUND WITH ACRYLIC POLYMERS. THE CURING AND SEALING SYSTEM SHALL MEET THE FOLLOWING REQUIREMENTS: ASTM C-309 (TYPE 1, CLASS A), ASTM C1315 (TYPE 1, CLASS A, MINIMUM 25% SOLIDS CONTENT).
  - A. ALL STAMPED CONCRETE TO BE SEALED SHALL BE SUFFICIENTLY CURED PRIOR TO APPLICATION OF SAID SEALANT. ALSO, ALL CAULKING AND EXPANSION JOINT WORK SHALL BE FULLY CURED PRIOR TO APPLICATION OF THE SEALANT. THE COVERAGE RATE SHALL BE 100 TO 125 SQUARE FEET PER GALLON, UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
  - B. ALL MATERIALS SHALL BE DELIVERED IN THE ORIGINAL MANUFACTURER'S SEALED CONTAINERS. MATERIALS SHALL BE STORED TO PREVENT DAMAGE TO THE CONTAINERS. THE SEALER SHALL BE THOROUGHLY STIRRED BEFORE AND DURING USE. SURFACE, AIR AND MATERIAL TEMPERATURES SHALL NOT BE LESS THAN 50 DEGREES FAHRENHEIT DURING APPLICATION OR WITHIN 4 HOURS AFTER SAID APPLICATION. AREAS NOT SUBJECT TO NATURAL VENTILATION SHALL HAVE POSITIVE VENTILATION PROVIDED THROUGHOUT THE APPLICATION. PERSONNEL SHALL BE WARNED AGAINST PROLONGED BREATHING OF VAPORS AND CONTACT OF MATERIALS WITH THE SKIN OF EYES. PROTECT OTHER SURFACES NOT BEING SEALED AS NECESSARY DURING THE APPLICATION PROCESS.
  - C. THE CONTRACTOR SHALL NOT ALLOW FOOT OR VEHICULAR TRAFFIC ON SURFACES WHICH HAVE BEEN SEALED UNTIL SUCH TIME AS THEY ARE THOROUGHLY DRY, AS DETERMINED BY THE ENGINEER.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

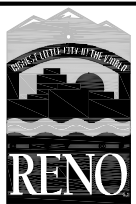
**INTEGRALLY COLORED AND STAMPED  
CONCRETE SIDEWALKS / DRIVEWAYS /  
PED RAMPS / CROSSWALKS**

**R-104H**

APPROVED BY: JF | DATE: 9/2013

## EXPANSION AND CONTROL JOINTS:

1. EXPANSION JOINTS AS SHOWN ON THE PLANS SHALL CONSIST OF A 1/2 INCH PREMOLDED EXPANSION JOINT WITH WHITE CAP OR BACKER ROD AND CAULK. THE PREMOLDED EXPANSION JOINT MATERIAL IS AN ASPHALT COATED FIBER EXPANSION JOINT, THE WHITE CAPE/BACKER IS A CLOSED BACKER ROD AND CAULK. WITHIN ROADWAY, THE CAULK SHALL BE A DOW CORNING 880 – SL SELF LEVELING SILICONE JOINT SEALANT OR APPROVED EQUAL. ALL OTHER LOCATIONS THE CAULK SHALL BE A SIKAFLEX 2C SL DEEP CHARCOAL OR APPROVED EQUAL. EXPANSION JOINTS (TRANSVERSE TO THE STREET CENTERLINE) SHALL BE CONSTRUCTED IN ALL CONCRETE SIDEWALKS, APPROACHES, DRIVEWAYS AT ALL CONSTRUCTION (COLD JOINTS) AND BETWEEN THE CONCRETE AND ANY EXISTING BUILDING. ALL JOINTS SHALL BE FILLED WITH THE PREMOLDED JOINT FILLER AS DESCRIBED ABOVE.
2. TRANSVERSE EXPANSION JOINTS 1/2 INCH WIDE SHALL BE CONSTRUCTED AT ALL SIDEWALK RETURNS OPPOSITE EXPANSION JOINTS IN ADJACENT CURB AND AT REGULAR INTERVALS NOT TO EXCEED 30 FEET. TRANSVERSE EXPANSION JOINTS SHALL ALSO BE CONSTRUCTED AT TRANSITION POINTS THAT WOULD NORMALLY CRACK DUE TO ANGLE POINTS OR SIMILAR OCCURRENCES. ISOLATION JOINTS SHALL BE INSTALLED AROUND ALL STRUCTURES.
3. SAWCUT JOINTS WILL BE REQUIRED BETWEEN EXPANSION JOINTS (INCLUDING CROSSWALKS) AS SPECIFIED:
  - A. FROM ALL ANGLE POINTS INCLUDING, BUT NOT LIMITED TO PULL BOXES, VAULTS, MANHOLES, PILLARS, DROP INLETS, STEEL INSERTS, STAIR WELLS, ETC., OR ANY ANGLE POINT FROM AN ADJOINING STRUCTURE.
  - B. SAW CUTS SHALL BE 1-1/4 INCH DEEP AND 1/8 INCH WIDE AND CHAMFERED.
  - C. AREA BETWEEN SAWCUT AND EXPANSION (CONSTRUCTION) JOINTS SHALL BE SQUARE AND NOT TO EXCEED 100 SQUARE FEET.
4. WEAKENED PLANE JOINTS (TOOL JOINTS) AS SPECIFIED HEREINAFTER:
  - A. TOOL JOINTS SHALL BE 1-1/4 INCH DEEP AND 1/2 INCH WIDE RADIUS AT THE TOP. ANY DEVIATIONS TO THESE REQUIREMENTS MUST BE APPROVED BY THE ENGINEER.
  - B. TOOL JOINTS SHALL BE LOCATED AT REGULAR INTERVALS NOT EXCEEDING 1.2 TIMES THE WIDTH AND NO MORE FREQUENTLY THAN 0.8 TIMES THE WIDTH, BUT IN NO CASE SHALL REGULAR INTERVALS OF TOOL JOINTS IN EITHER DIRECTION EXCEED 10 FEET.



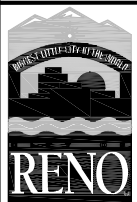
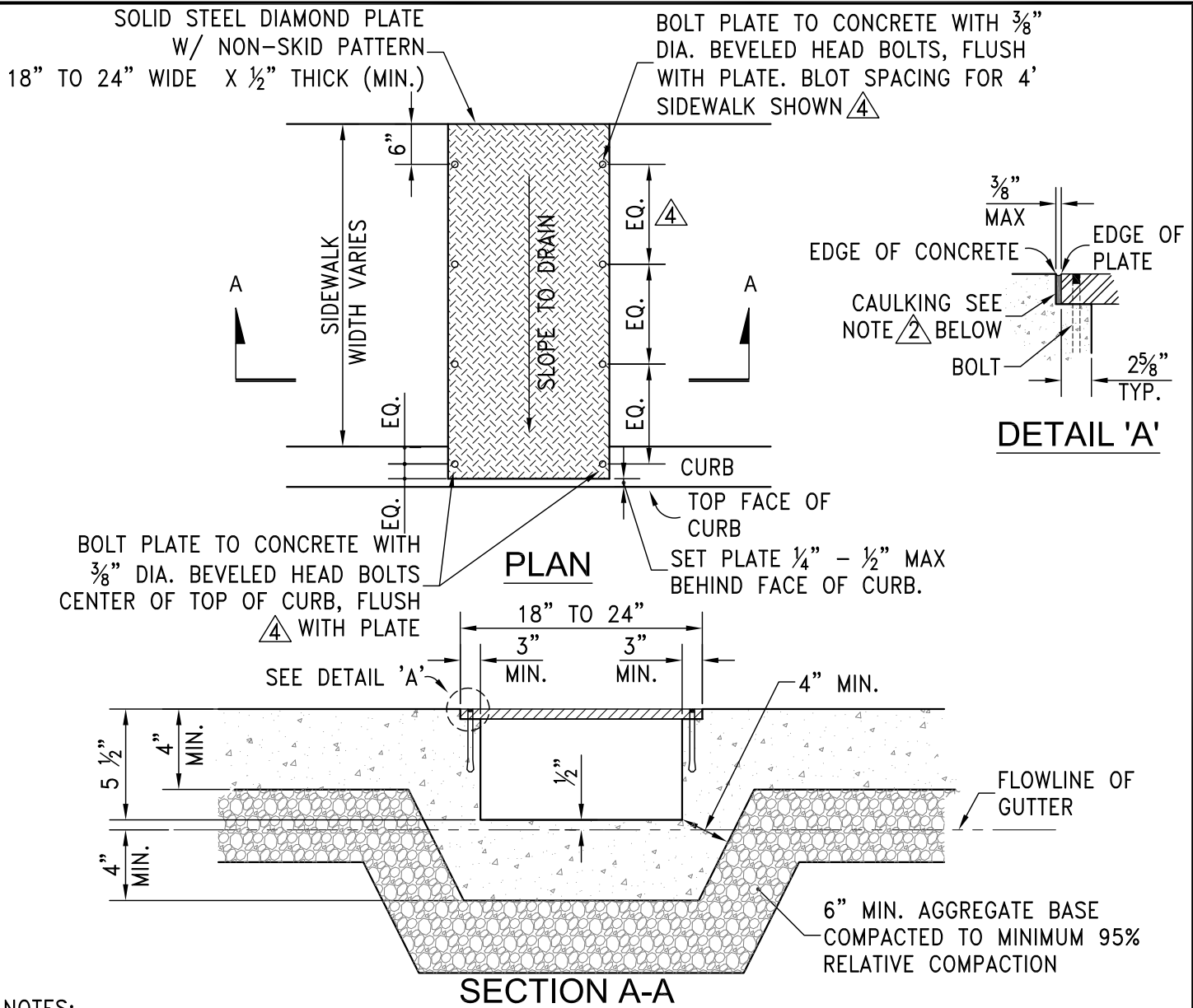
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**EXPANSION AND CONTROL JOINTING COLORED  
AND STAMPED CONCRETE SIDEWALKS /  
DRIVEWAYS / PED RAMPS / CROSSWALKS**

DRAWING No.

**R-104I**

APPROVED BY: JF    DATE: 9/2013



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

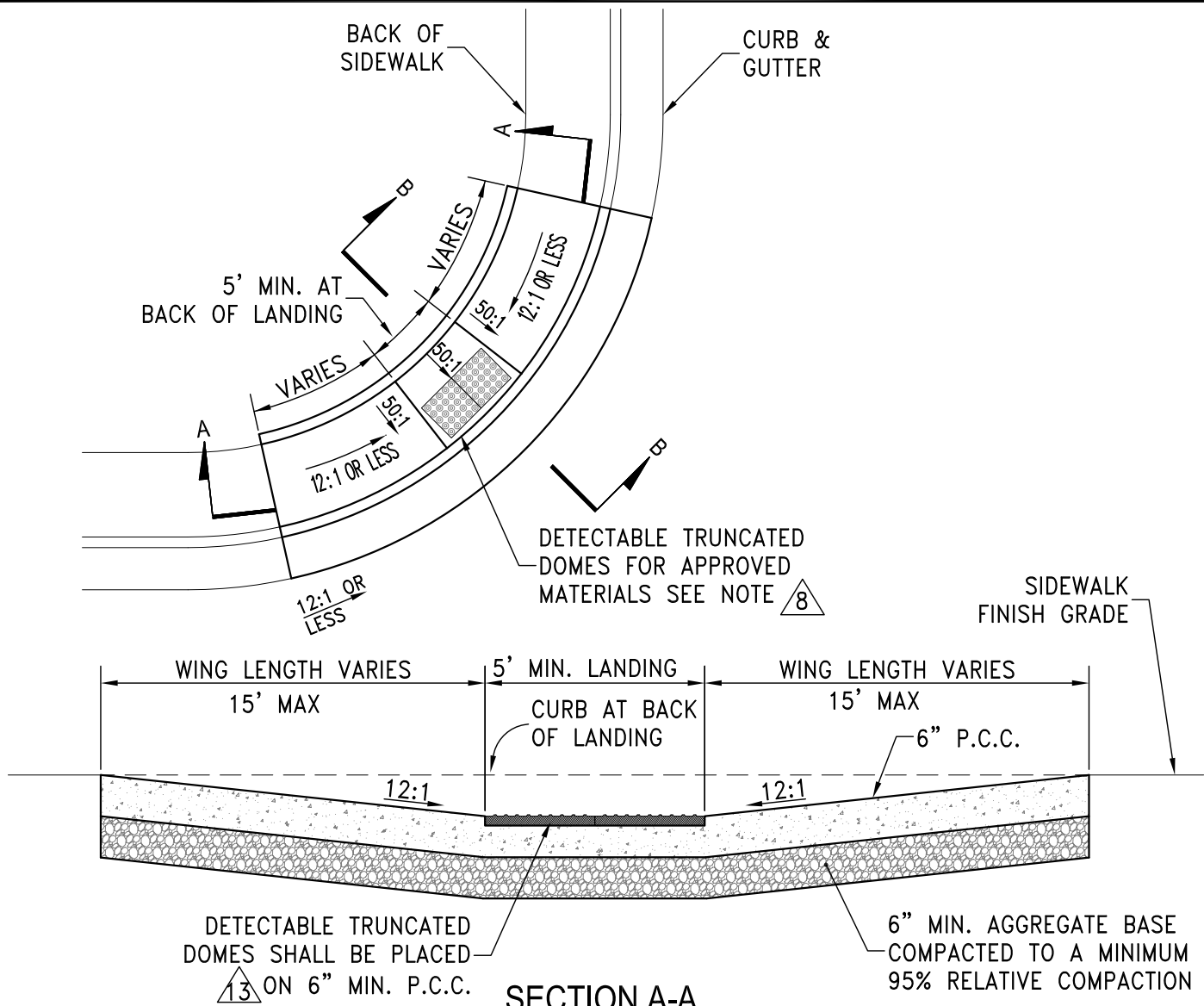
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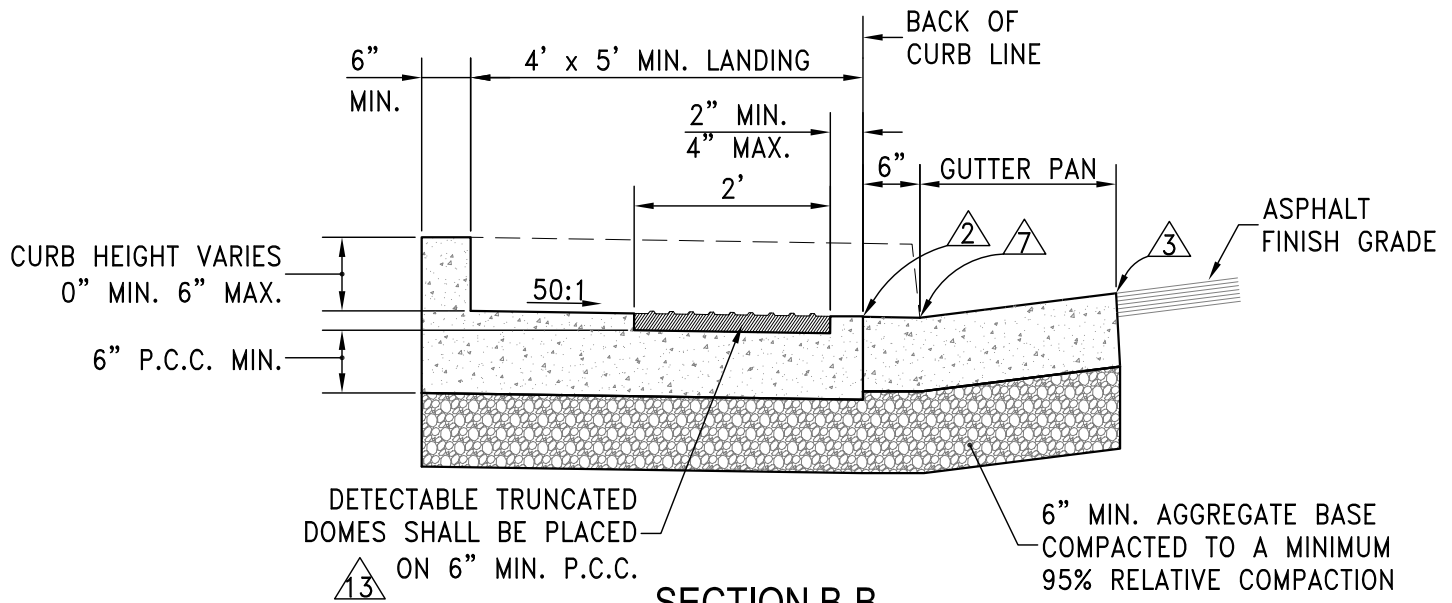
R-105

APPROVED BY: JF DATE: 1/2013

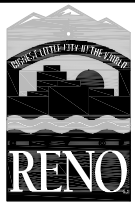




SECTION A-A



SECTION B-B



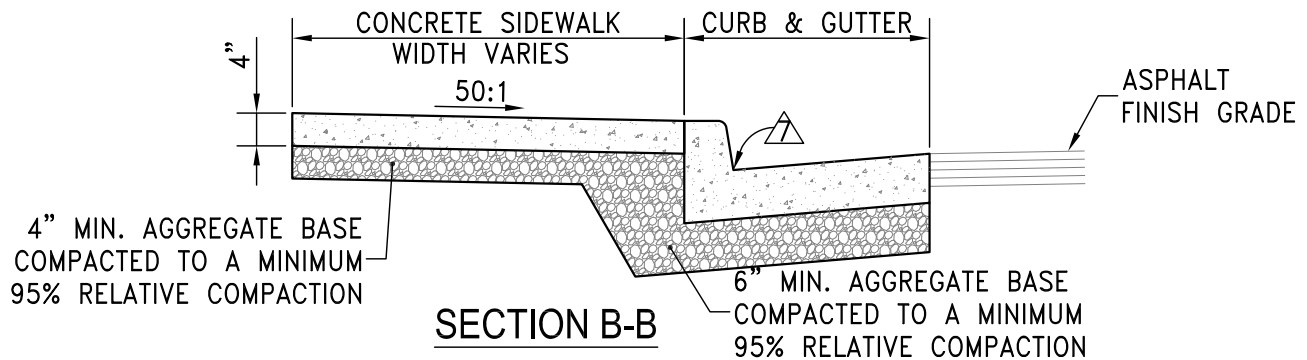
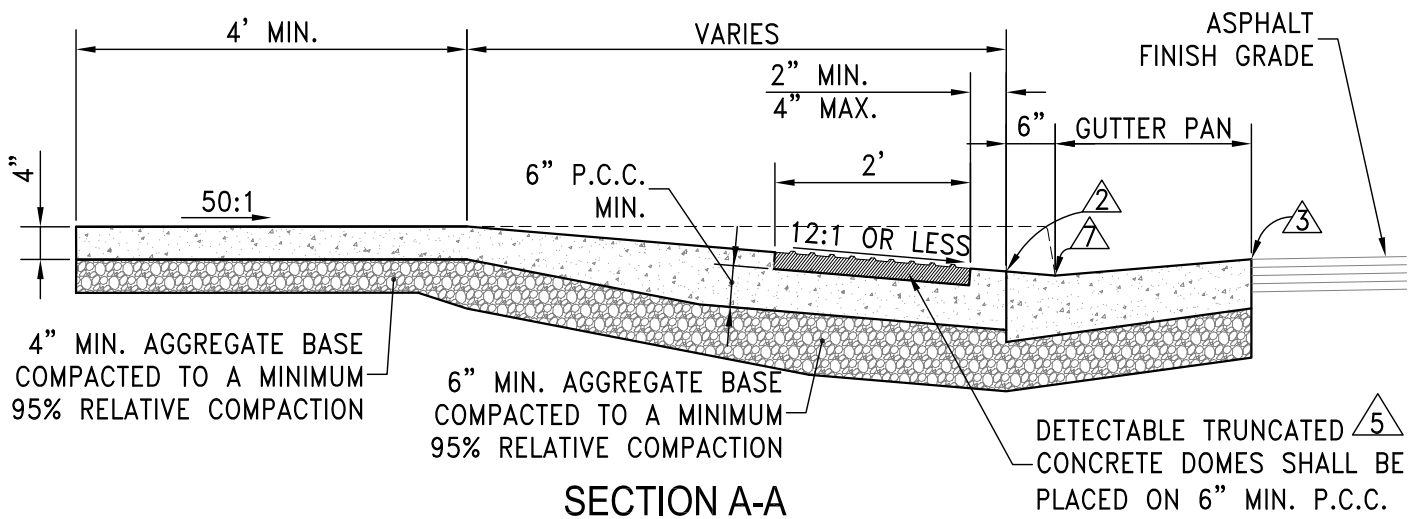
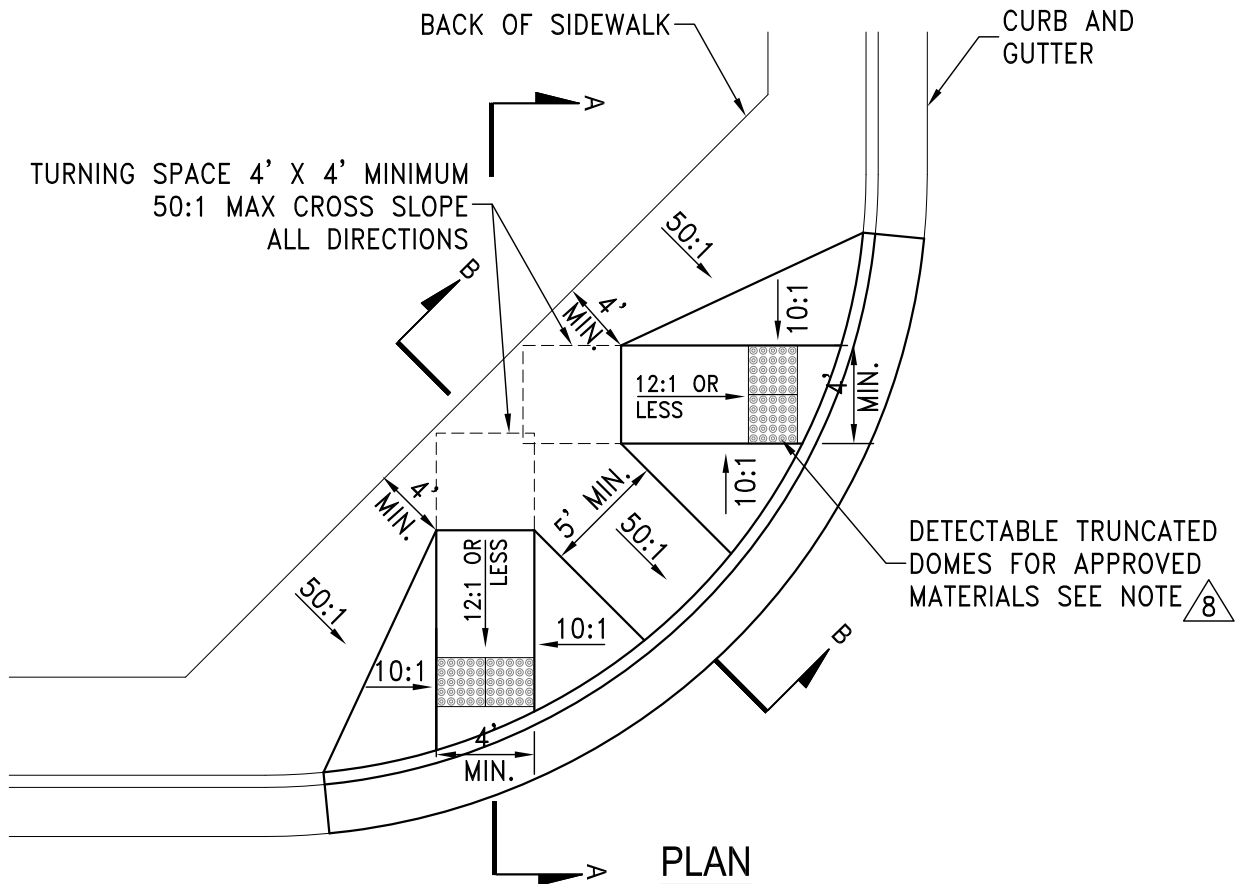
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# PEDESTRIAN RAMP - EXISTING SIDEWALKS

DRAWING No.

R-106A

APPROVED BY: JF DATE: 1/2013



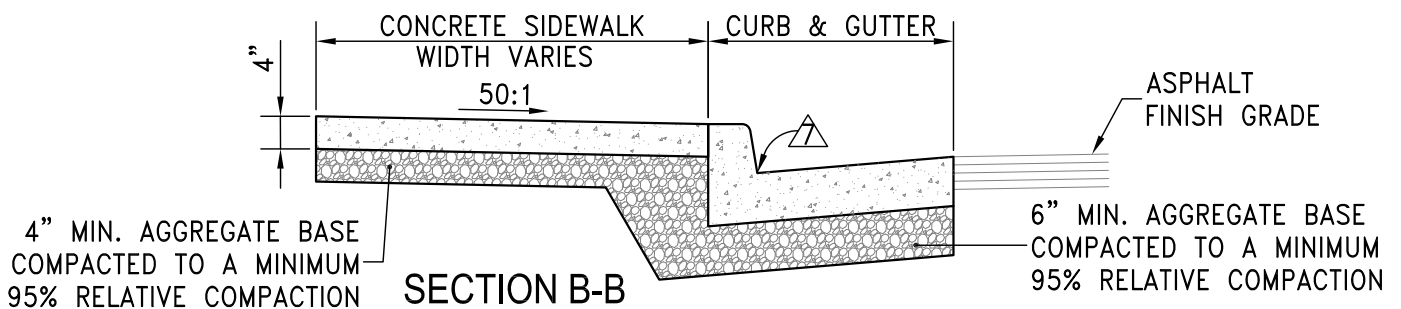
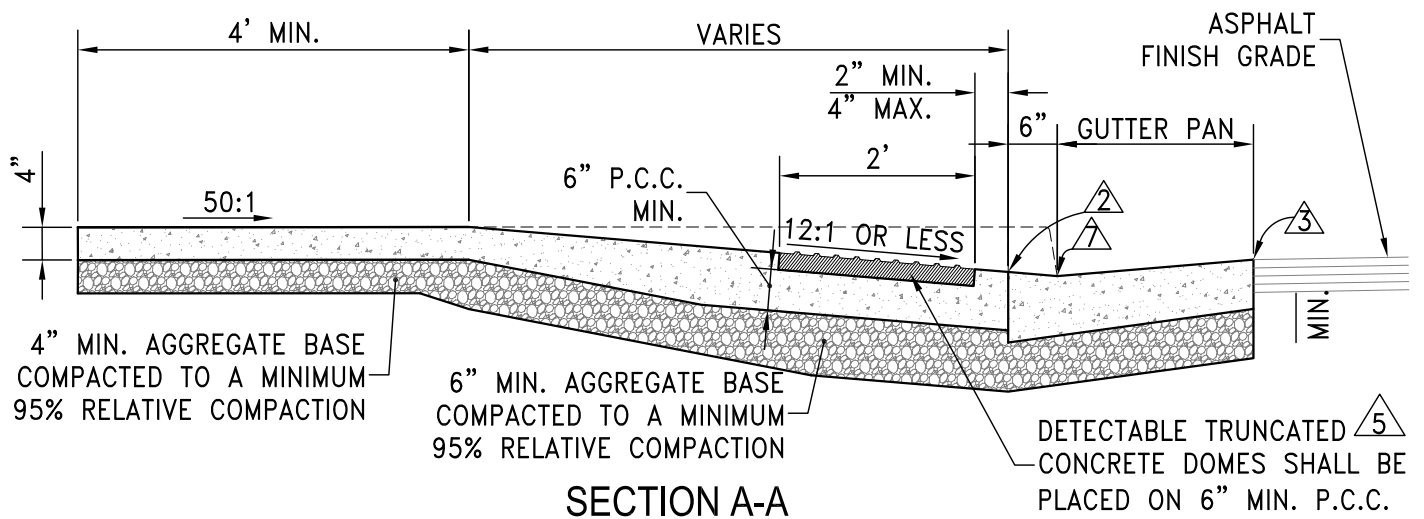
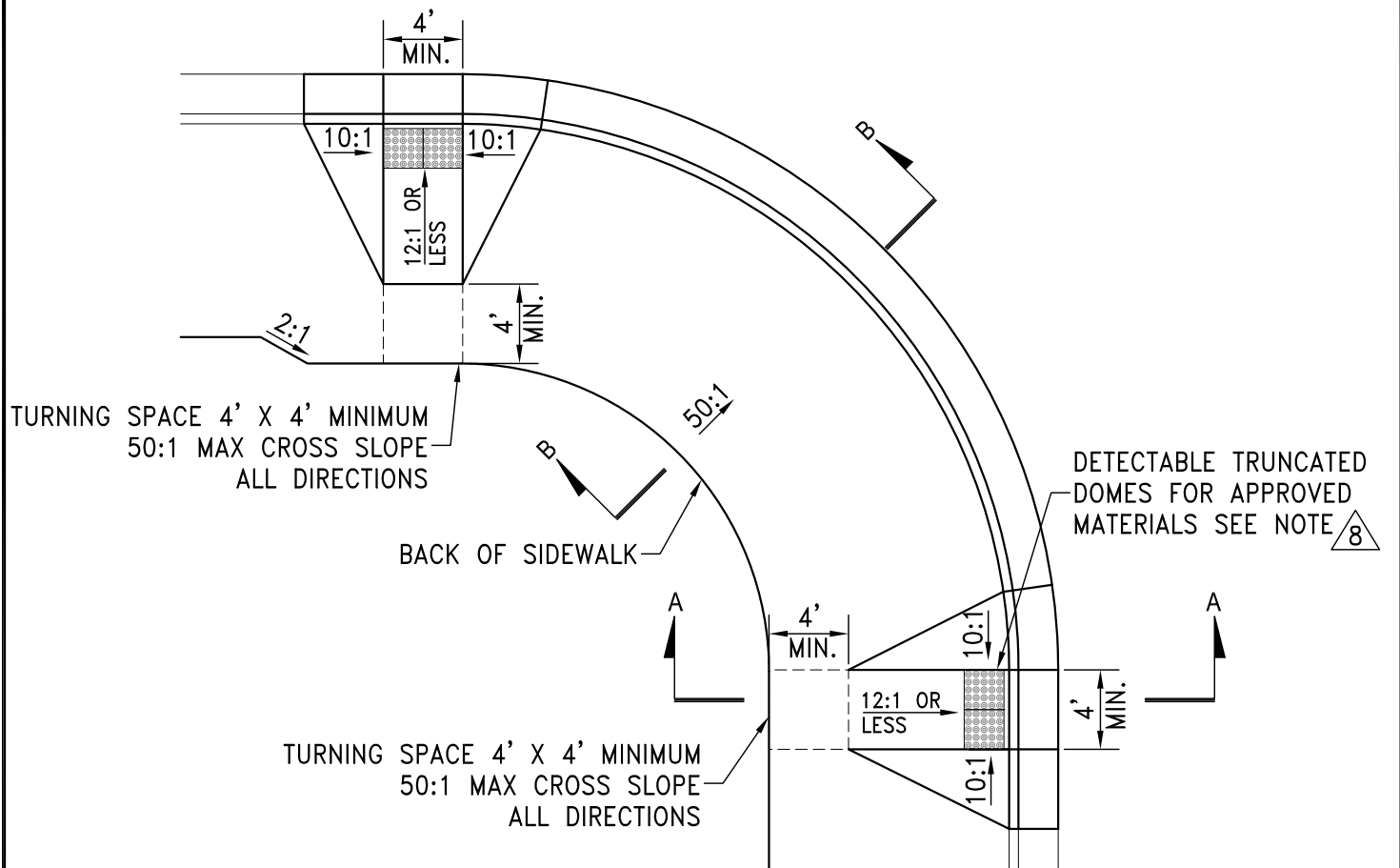
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# PEDESTRIAN RAMP - NARROW SIDEWALKS

R-106B

APPROVED BY: JF DATE: 1/2013



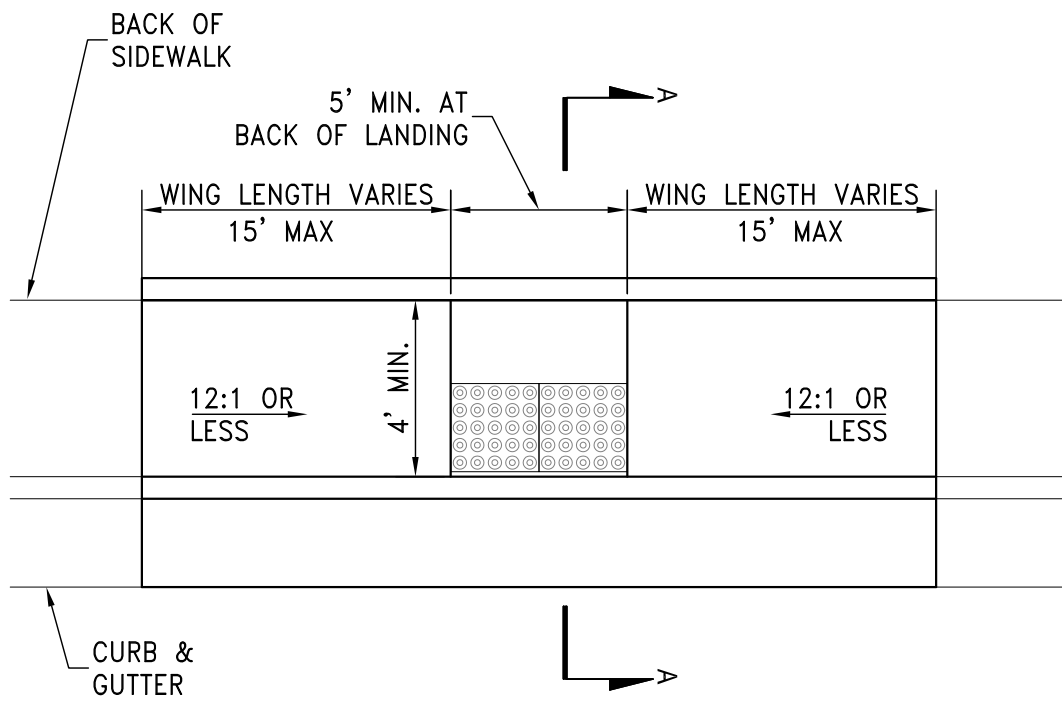
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# PEDESTRIAN RAMP - WIDE SIDEWALKS

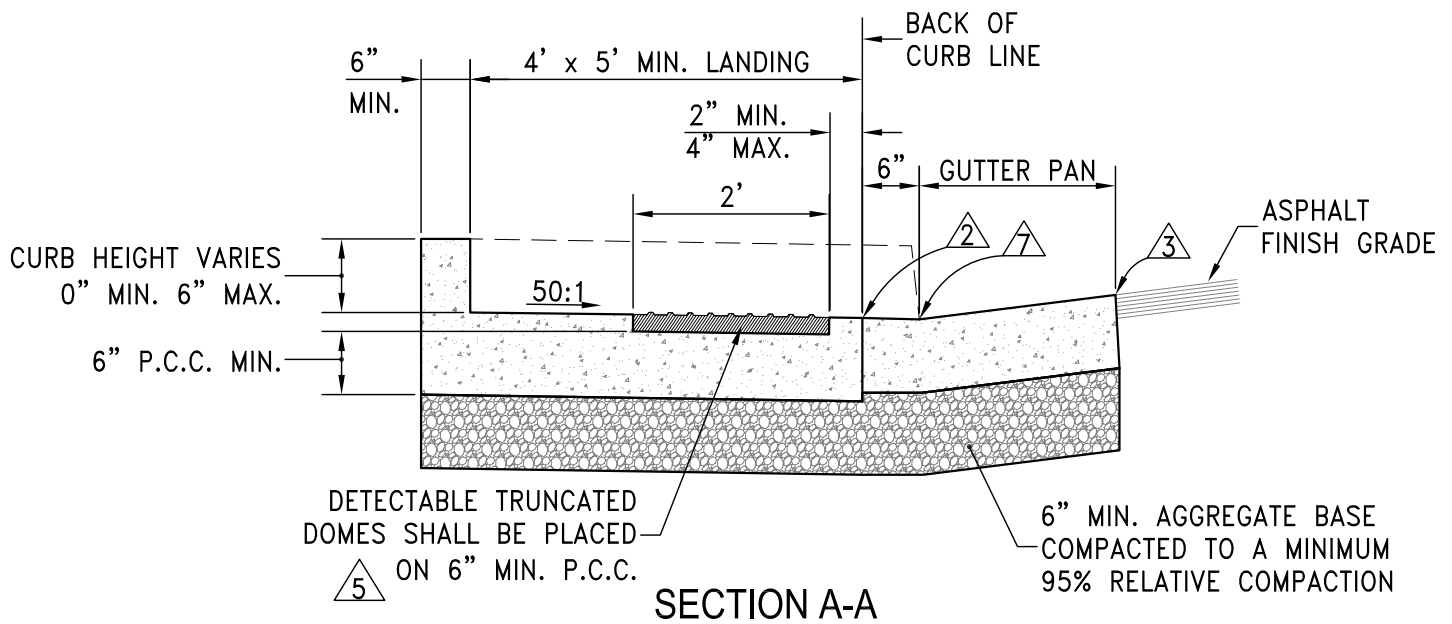
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R-106C

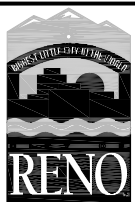
APPROVED BY: JF | DATE: 1/2013



PLAN



SECTION A-A



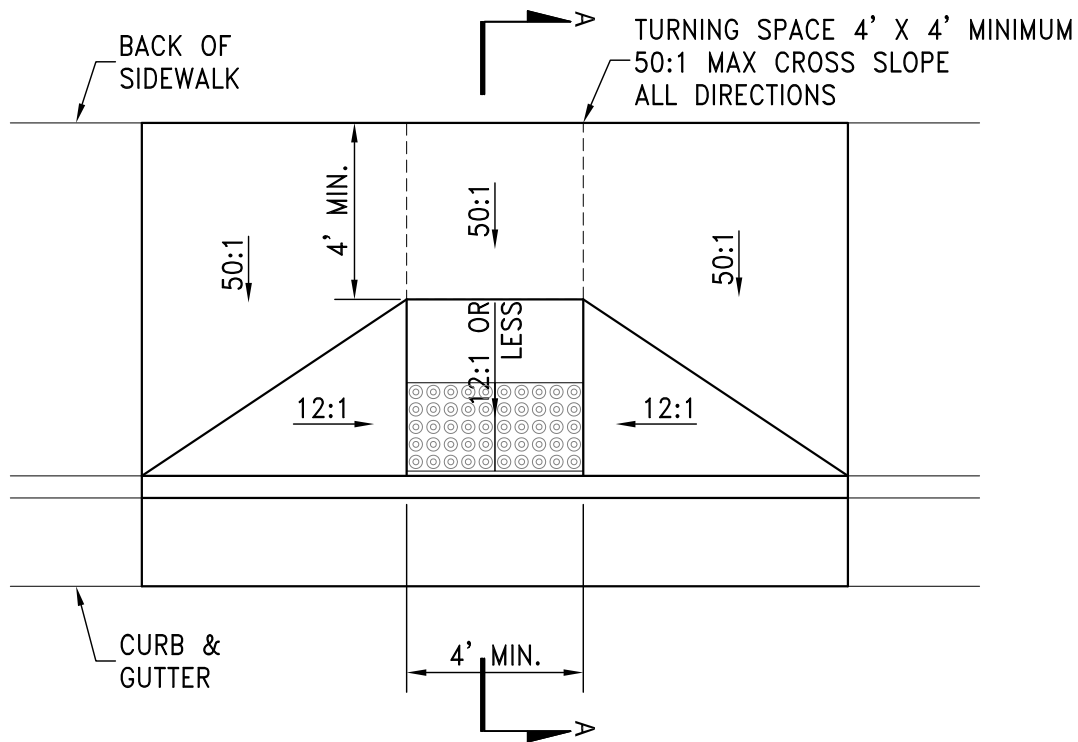
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# **PEDESTRIAN RAMP MIDBLOCK - TYPE 1**

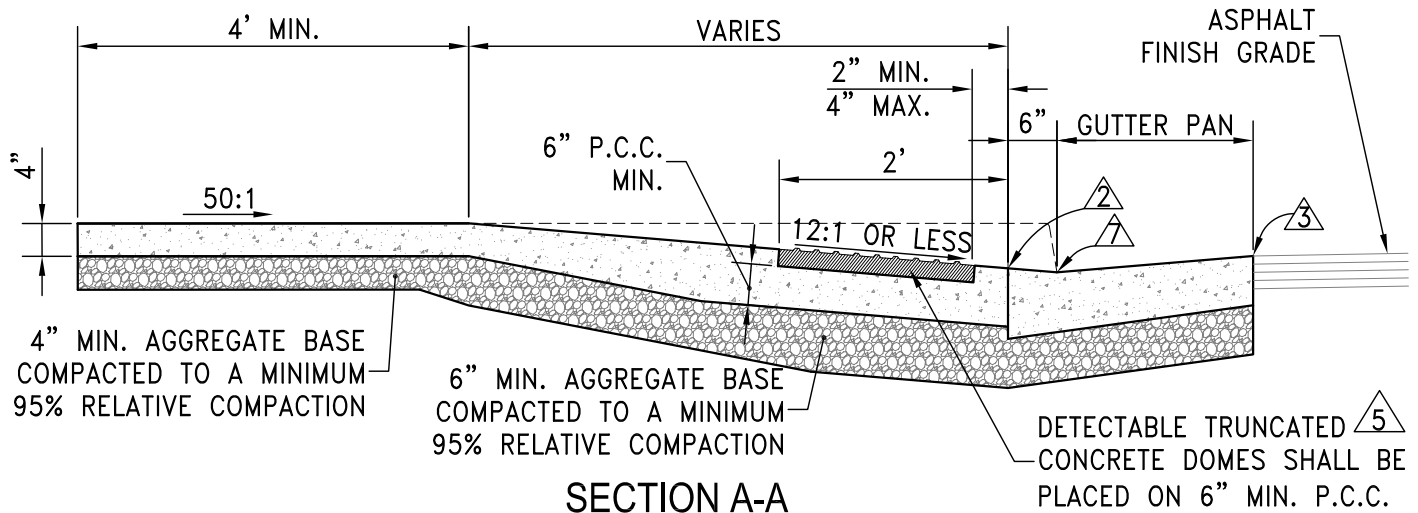
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**R-106D**

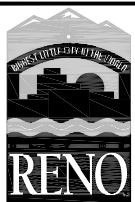
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PLAN



SECTION A-A



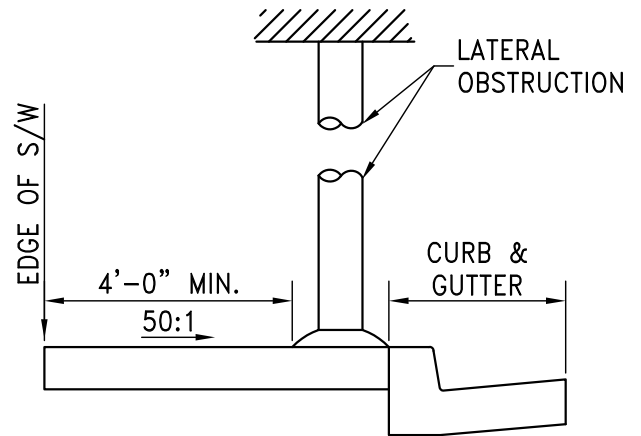
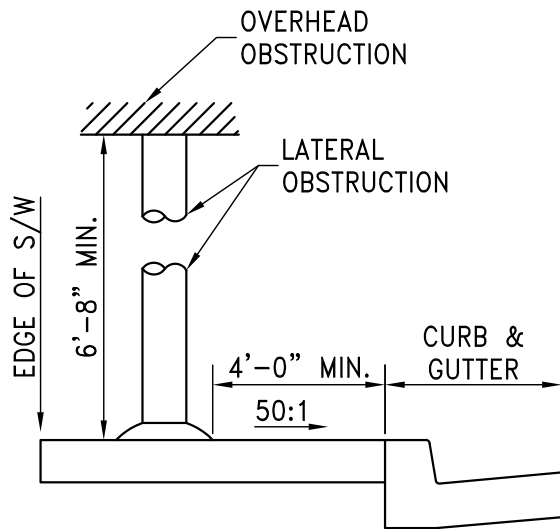
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# PEDESTRIAN RAMP MIDBLOCK - TYPE 2

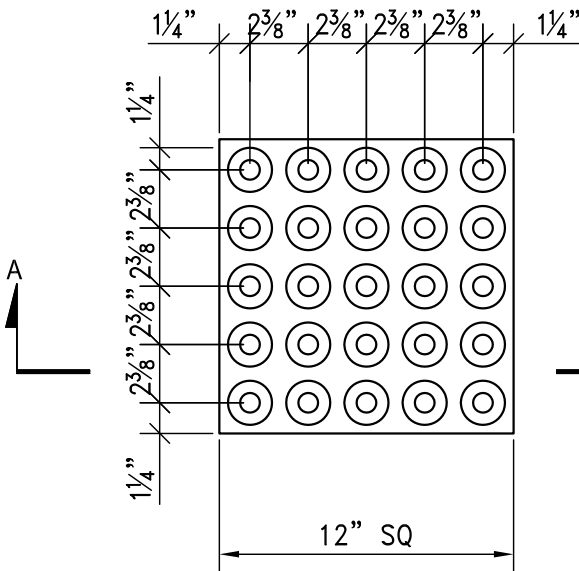
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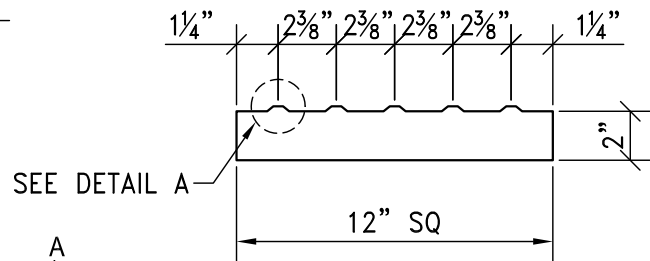
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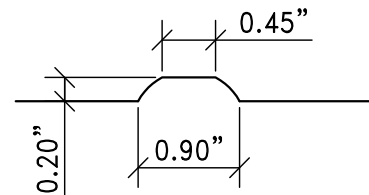
### TYPICAL SIDEWALK vs OBSTRUCTION CLEARANCE DETAIL



PLAN



SECTION A-A



DETAIL A

NOTE: FOR DETECTABLE TRUNCATED DOMES APPROVED MATERIALS SEE NOTE 

### TRUNCATED DOMES DETAIL



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## PEDESTRIAN RAMP - DETAILS

DRAWING No.

R-106F

APPROVED BY: JF | DATE: 1/2013

1. STORM DRAIN INLETS OR SIMILAR ACCESSES SHALL NOT BE LOCATED IN THE AREA AT THE BASE OF THE CURB RAMP OR LANDING AREA. IF OBSTRUCTIONS SUCH AS INLETS, UTILITY POLES, PULL BOXES, FIRE HYDRANTS, ETC. ARE ENCOUNTERED, THE LOCATION AND DIMENSIONS MAY BE ADJUSTED UPON APPROVAL OF THE ENGINEER.
2. NO LIP SHALL BE PERMITTED AT THE CURB RAMP SLOPE TO GUTTER PAN.
3. PLANTMIX BITUMINOUS SURFACE SHALL BE FLUSH WITH THE EDGE OF THE GUTTER PAN IN THE AREA OF THE CURB RAMP.
4. ROUGH BROOM TEXTURE ON CURB RAMPS AND WINGS.
5. DETECTABLE WARNING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS AND SHALL BE PLACED ON MIN. SIX (6") INCHES OF P.C.C.
6. ALL SLOPE RATES ARE RELATIVE TO LEVEL AND SHALL COMPLY WITH THE PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG) STANDARDS, CURRENT VERSION.
7. GUTTER SHALL MAINTAIN POSITIVE DRAINAGE TO PREVENT PONDING.
8. DETECTABLE WARNING SHALL CONSIST OF PRECAST WETSET TILES WITH MIN. SIZE OF 2' X 2', COLOR DARK RED. APPROVED PRODUCTS INCLUDE: "CASTinTACT", "TEKWAY DOME-TILES", "ARMOR CAST WET SET TILES", AND "ARCIS WET SET TILES". DETECTABLE WARNING SHALL BE CONSTRUCTED PER MANUFACTURER'S INSTALLATION GUIDELINES AND CONFORM TO ADAAG.
9. CONCRETE REMOVAL SHALL BE TO NEAT SAW CUT LINES
10. AGGREGATE BASE MATERIAL UNDER PEDESTRIAN RAMPS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
11. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
12. CONTRACTORS SHALL CORRECT ANY GRADE CONFLICT WITH EXISTING BOXES. THE ENGINEER SHALL MAKE THE FINAL DETERMINATION REGARDING THE DEGREE OF MODIFICATIONS REQUIRED BY THE CONTRACTOR FOR GRADE CONFLICTS BETWEEN EXISTING BOXES AND NEW PEDESTRIAN RAMPS.
13. SIDEWALK AT BOTH SIDES OF RAMP MAY BE RECONSTRUCTED TO MINIMIZE THE GRADE AT A HORIZONTAL DISTANCE TO BE DETERMINED IN THE FIELD, UPON APPROVAL OF THE ENGINEER, SUBJECT TO PROWAG REQUIREMENTS. CURB AT THE BACK OF WALK MAY BE NEEDED. A TRANSITION SECTION OF SIDEWALK MAY BE NECESSARY TO MATCH CROSS SLOPE OF EXISTING SIDEWALK TO PEDESTRIAN RAMP IMPROVEMENTS. TRANSITION SECTIONS SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
14. CONTRACTOR SHALL CONSTRUCT ROUNDED CURBS WHERE THEY INTERSECT. RADIUS SHALL BE 1 FT MINIMUM MEASURED FROM FACE OF CURB. CURBS THAT INTERSECT AT A POINT SHALL NOT BE ALLOWED.



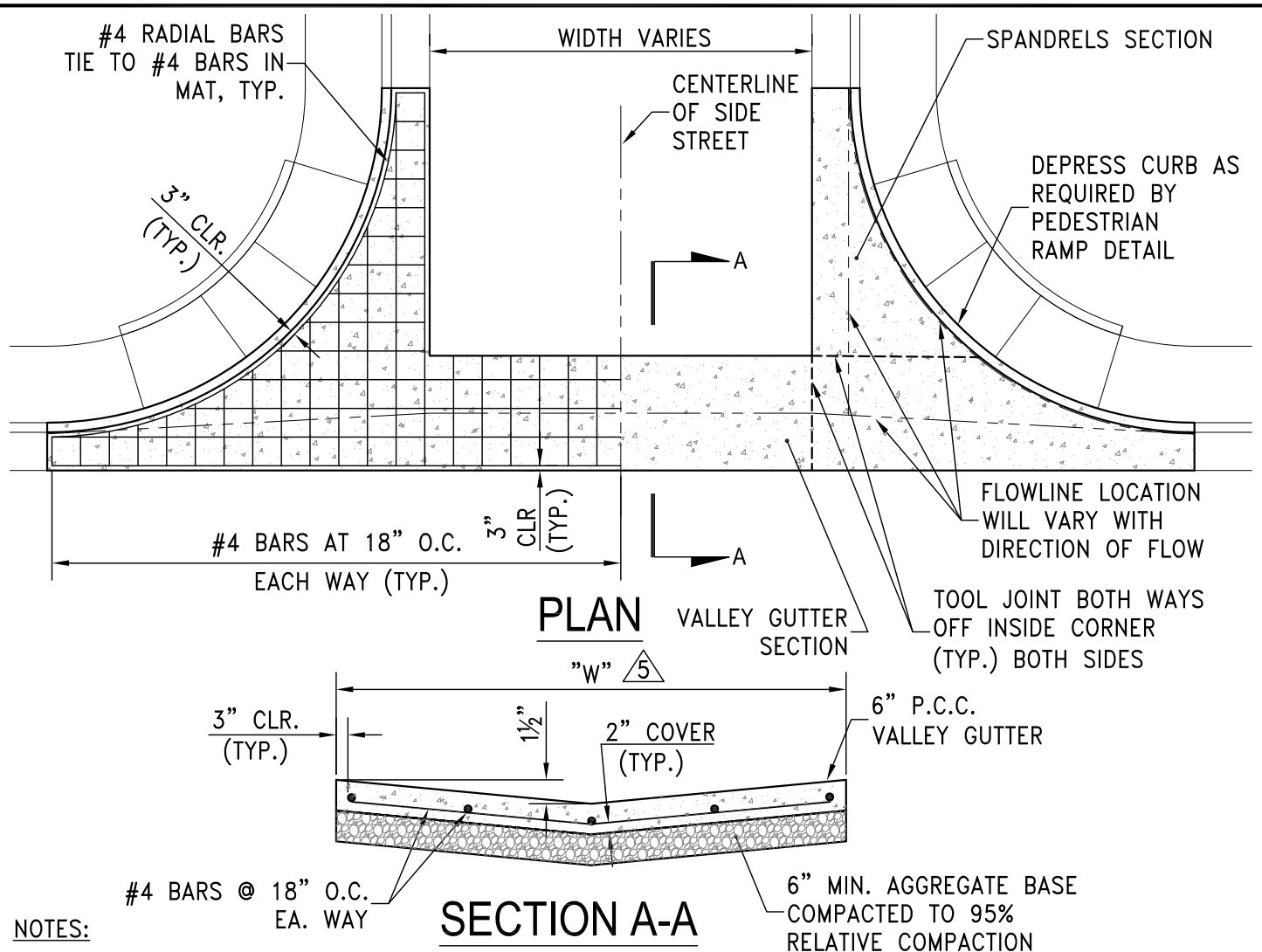
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

## NOTES - PEDESTRIAN RAMP

R-106G

APPROVED BY: JF      DATE: 1/2013



1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. AGGREGATE BASE UNDER VALLEY GUTTER AND SPANDRELS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE. ALL MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. P.C.C VALLEY GUTTER DETAIL FOR RESIDENTIAL OR COMMERCIAL ZONES ONLY FOR OTHER APPLICATIONS AN ENGINEERED DESIGN IS REQUIRED.
4. VALLEY GUTTER SHALL HAVE WEAKENED PLANE JOINTS EVERY 10 FEET.
5. LOCAL AND COLLECTOR STREETS, "W"=6' MIN. ARTERIAL STREETS (DRIVEWAYS ONLY), "W"=10' MIN.
6. VALLEY GUTTER SECTIONS (SPANDRELS) ALONG CURB & GUTTER MAY BE A MONOLITHIC POUR AS SHOWN. DOWELS MATCHING REBAR SPACING SHOWN ARE REQUIRED FROM VALLEY GUTTER SECTION TO SPANDREL SECTION IF POURED SEPARATELY.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

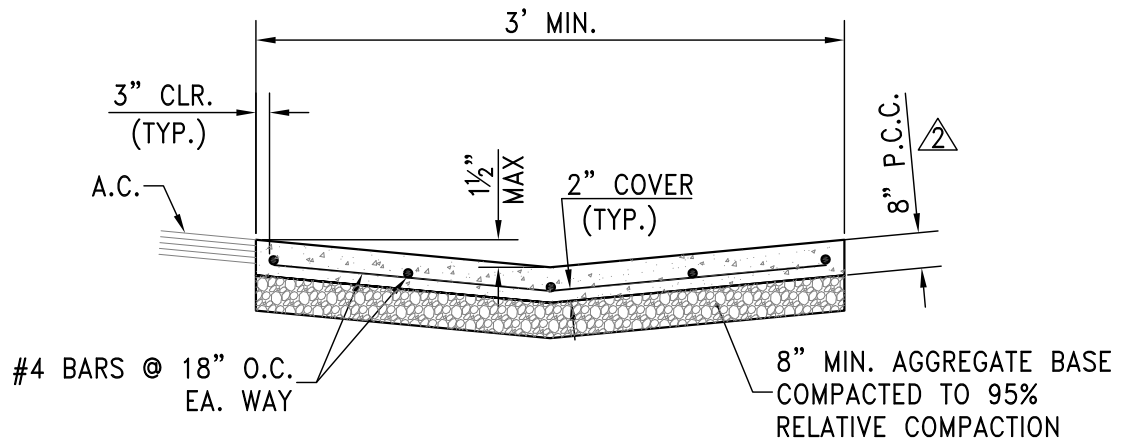
## P.C.C. VALLEY GUTTER

DRAWING No.

R-107

APPROVED BY: JF DATE: 1/2013



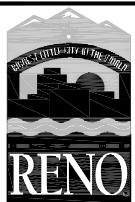


**NOTES:**

1. THIS GUTTER DESIGN IS FOR USE ON CITY STREETS.

2. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.

3. AGGREGATE BASE MATERIAL UNDER SIDEWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.



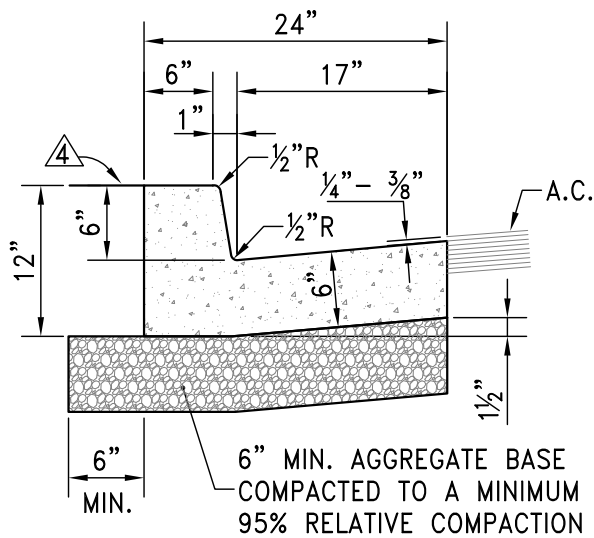
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**LONGITUDINAL  
P.C.C. VALLEY GUTTER**

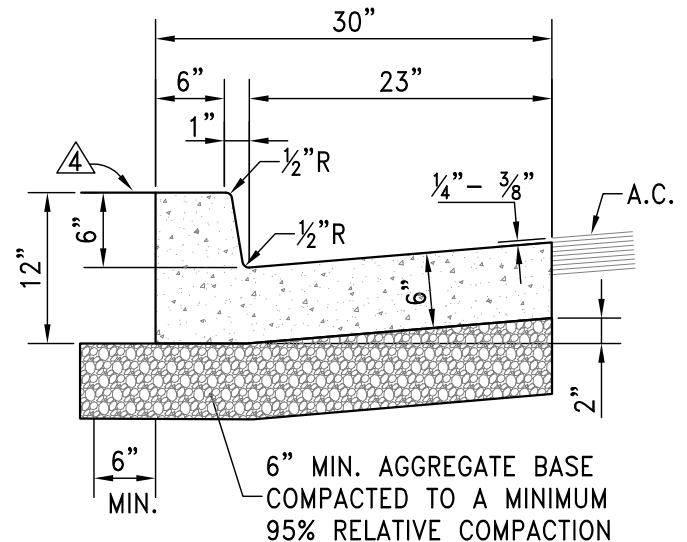
DRAWING No.

**R-108**

APPROVED BY: JF | DATE: 1/2013



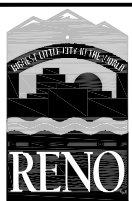
**TYPE 1**



**TYPE 1A**

**NOTES:**

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. AGGREGATE BASE MATERIAL UNDER AND BEHIND CURB AND GUTTER SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. WEAKENED PLANE JOINTS SHALL BE EVERY 10 FEET AND LOCATED ON THE BACK, TOP AND FACE OF THE CURB AND THE TOP OF THE GUTTER PAN.
4. CURB & GUTTER SECTIONS SHALL BE PLACED SEPARATELY FROM SIDEWALK SECTIONS. WHEN SIDEWALK IS NOT REQUIRED DIRECTLY BEHIND THE CURB, BACKFILL TO TOP OF CURB FOR A HORIZONTAL DISTANCE OF 12" FROM BACK FACE OF CURB AND COMPACT TO 90% RELATIVE COMPACTION.
5. FOR REPLACEMENT OF EXISTING CURB AND GUTTER, MATCH EXISTING TYPE.



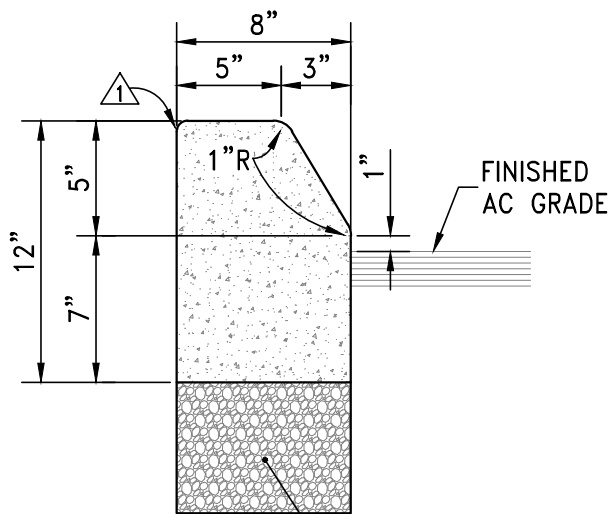
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**P.C.C.  
CURB & GUTTER**

DRAWING No.

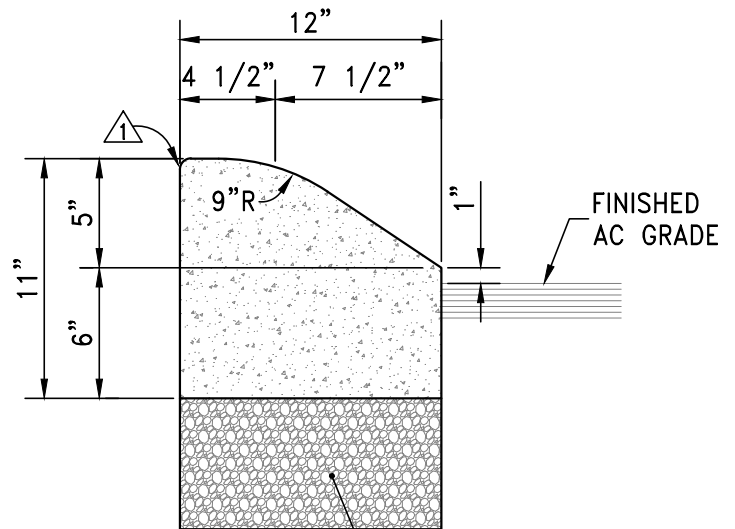
**R-109**

APPROVED BY: JF | DATE: 1/2013



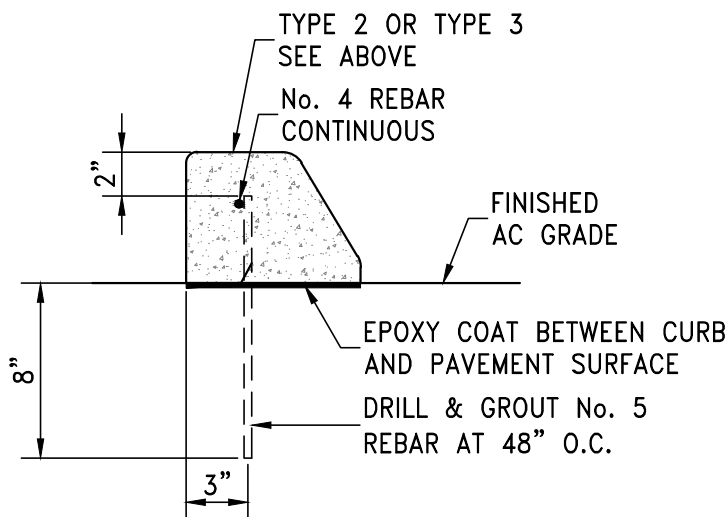
6" MIN. AGGREGATE BASE  
COMPACTED TO A MINIMUM  
95% RELATIVE COMPACTION

**TYPE 2 P.C.C. MEDIAN CURB**



6" MIN. AGGREGATE BASE  
COMPACTED TO A MINIMUM  
95% RELATIVE COMPACTION

**TYPE 3 P.C.C. MEDIAN CURB**



**P.C.C. MEDIAN CURB (ALTERNATE)**

**NOTES:**

① RADIUS TO BE 1/2 INCH, OMIT ROUNDING IF CURBS ARE BACK TO BACK.

2. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.

3. AGGREGATE BASE MATERIAL UNDER MEDIAN CURBS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

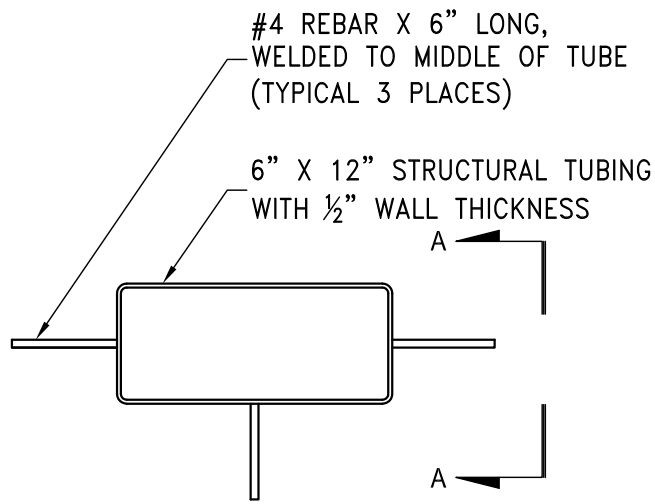
**P.C.C. MEDIAN CURBS**

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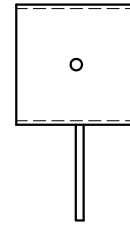
**R-110**

APPROVED BY: JF

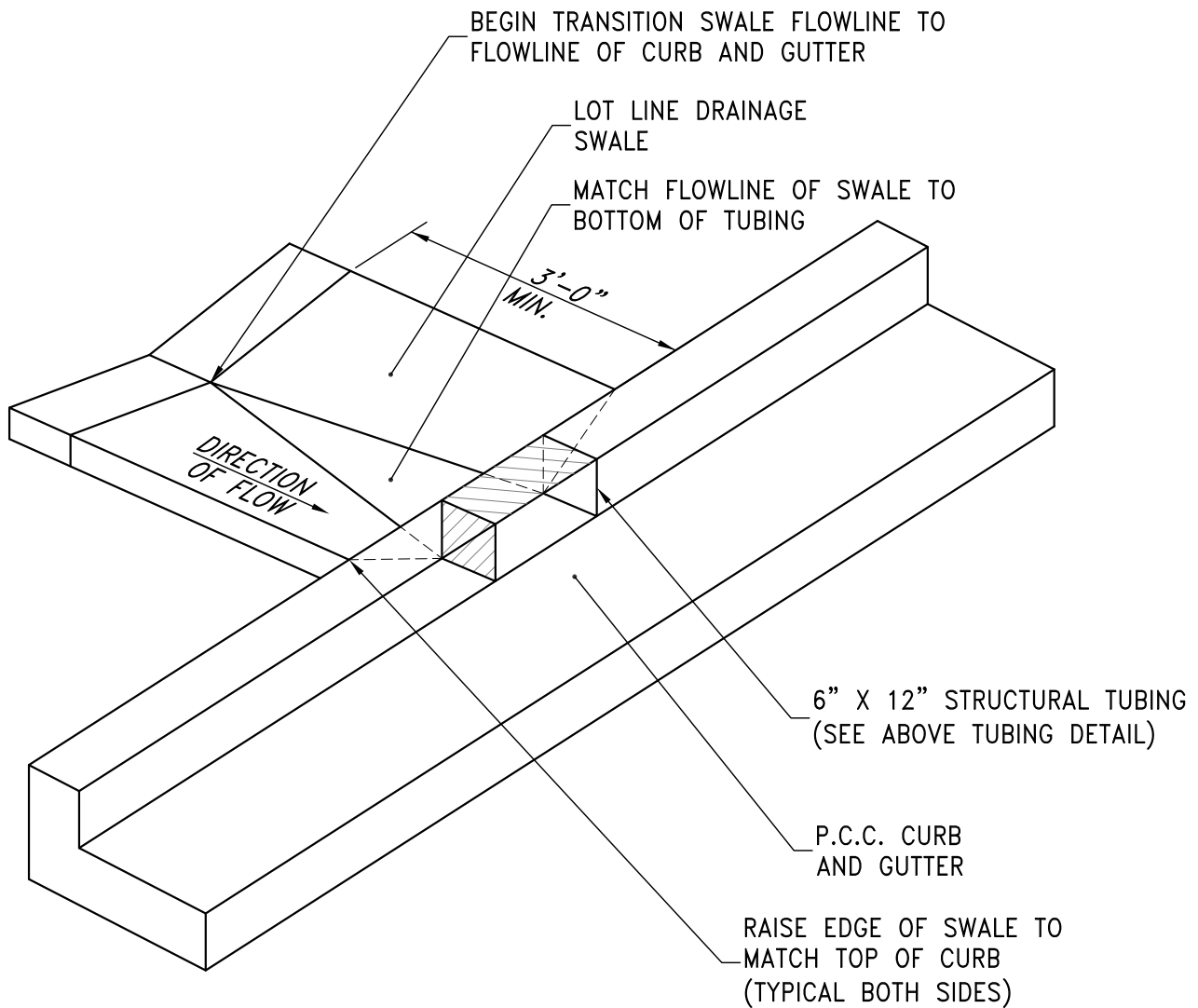
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TUBING DETAIL



SECTION A-A



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

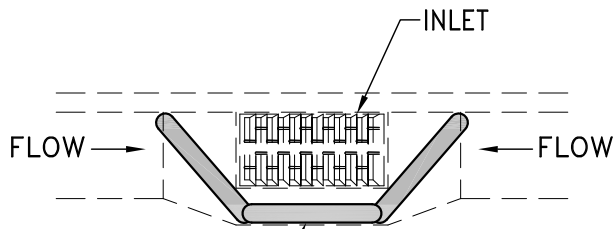
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**CURB OPENING**

**R-112**

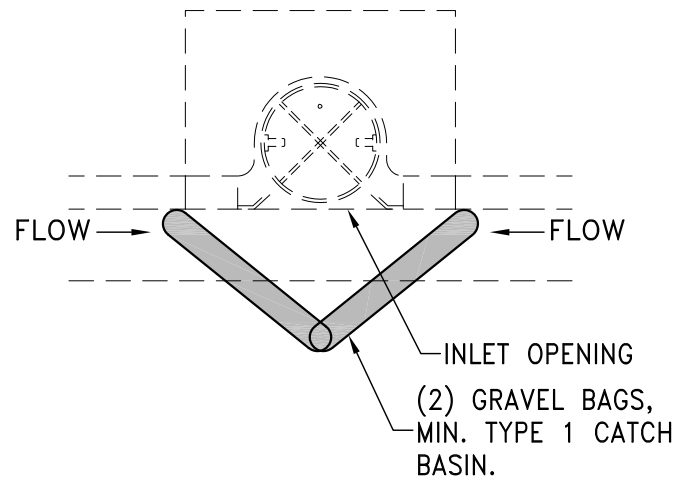
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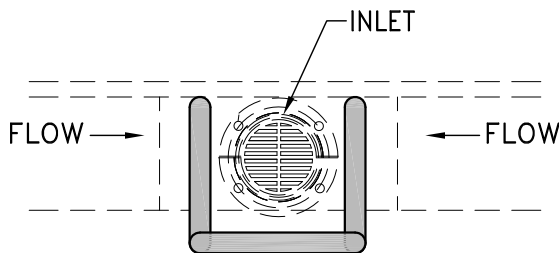


(3) GRAVEL BAGS MIN.  
TYPE 4R CATCH BASIN.

**TYPE 4R CATCH BASIN**



**TYPE 1 CATCH BASIN**



(3) GRAVEL BAGS MIN.  
INLET TYPE CATCH  
BASIN.

**INLET TYPE CATCH BASIN**

**NOTES:**

1. ALL STORM DRAIN INLET PROTECTION SHALL BE IN PLACE PRIOR TO COMMENCING CONSTRUCTION. ALL SITE BMP PLACEMENT AND MAINTENANCE SHALL CONFORM TO THE REQUIREMENTS OF THE CONTRACTOR'S STORM WATER POLLUTION PREVENTION PLAN (SWPPP).
2. THE CONTRACTOR SHALL INSPECT THE SITE DAILY, PRIOR TO FORECASTED WEATHER EVENTS AND WITHIN 24 HOURS OF ANY EVENT THAT CREATES RUNOFF AT THE SITE. DISTURBED OR BROKEN BAGS SHALL BE REPLACED. SEDIMENT AND DEBRIS SHALL BE REMOVED AND DISPOSED.
3. GRAVEL BAGS:
  - 3.1. BAGS SHALL BE WOVEN POLYPROPYLENE, POLYETHYLENE OR POLYAMITE FABRIC, MIN. WEIGHT 4oz/SY, MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRA VIOLET STABILITY EXCEEDING 70%.
  - 3.2. EACH GRAVEL-FILLED BAG SHALL HAVE A MIN. LENGTH OF 30", MIN. WIDTH OF 8" AND MIN. THICKNESS OF 4".
  - 3.3. GRAVEL SHALL BE BETWEEN ½" TO 1" IN DIAMETER AND CLEAN AND FREE FROM CLAY BALLS, ORGANIC MATTER AND OTHER DELETERIOUS MATERIALS.
4. AFTER CONSTRUCTION WHEN GRAVEL BAGS ARE REMOVED, ALL CONSTRUCTION MATERIAL, DEBRIS, SEDIMENT, ETC. SHALL BE REMOVED FROM INLET OR CATCH BASIN BY VACUUM TRUCK.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

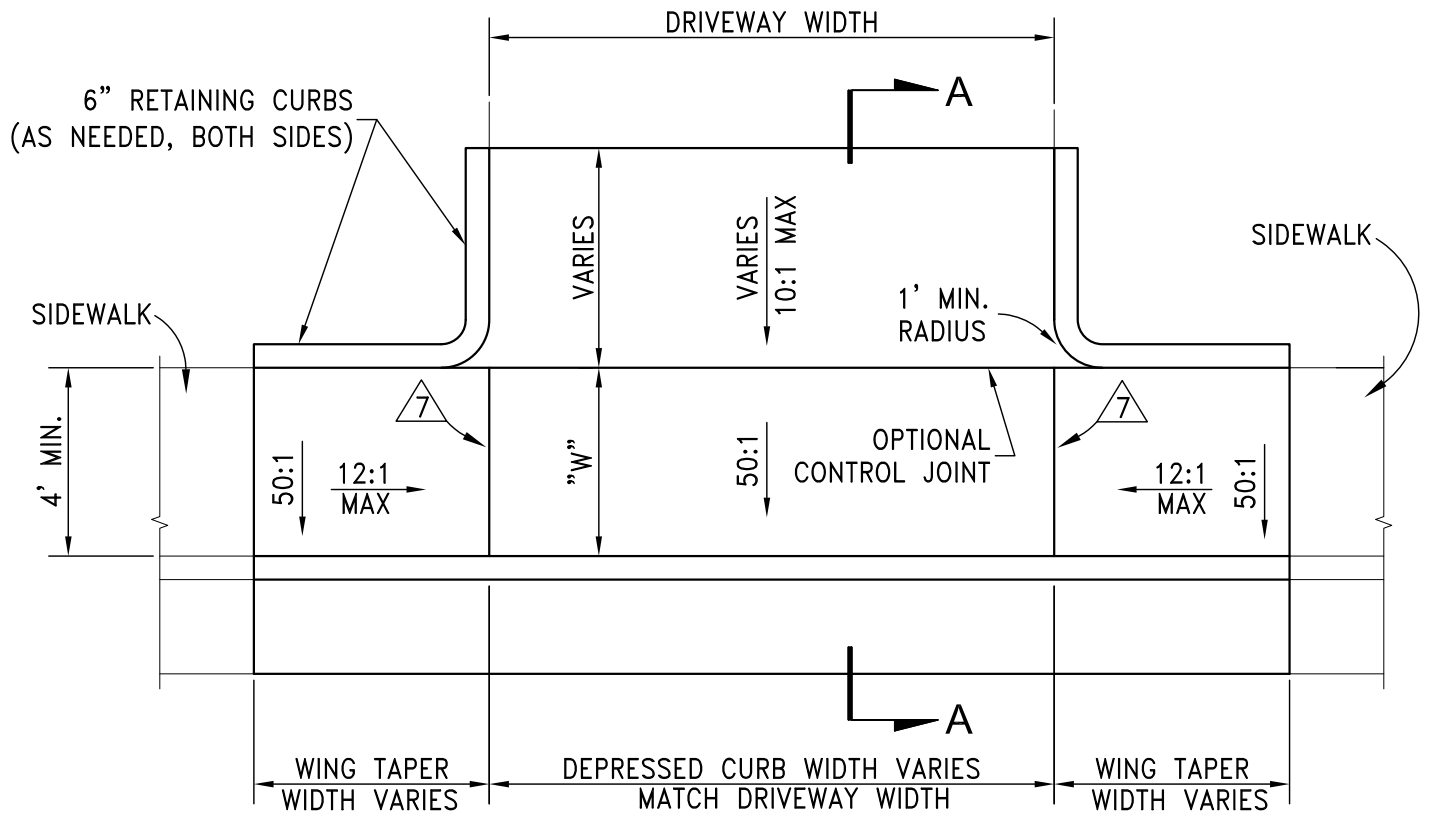
**STORM DRAIN INLET  
PROTECTION**

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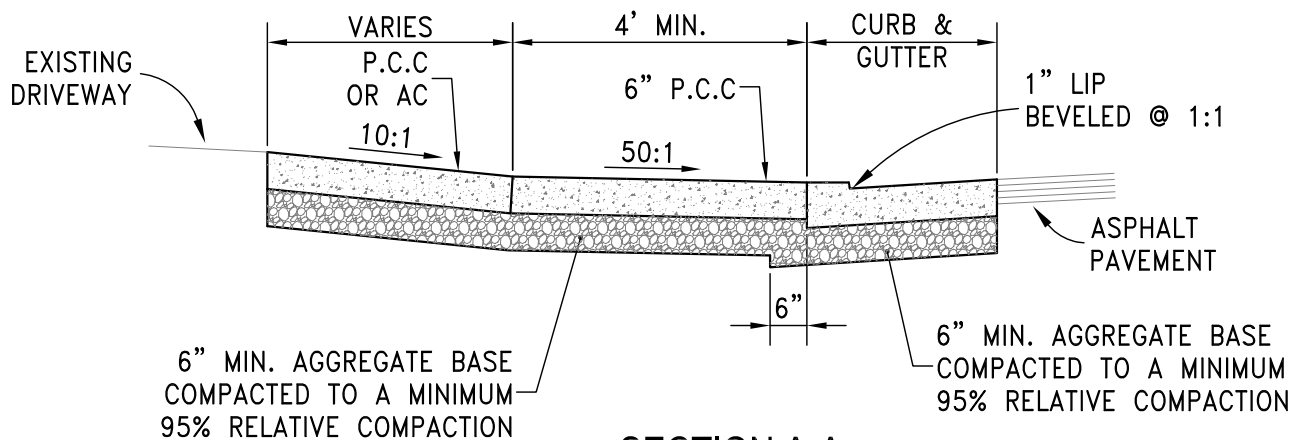
**R-113**

APPROVED BY: JF

DATE: 1/2013



**PLAN**



**SECTION A-A**



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**P.C.C. DRIVEWAY APRON**

**R-114A**

APPROVED BY: JF | DATE: 1/2013

NOTES:

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. AGGREGATE BASE MATERIAL UNDER DRIVEWAYS AND SIDEWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. ALL MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. RESIDENTIAL DRIVEWAYS SHALL BE POURED SEPARATE FROM CURB AND GUTTER.
4. COMMERCIAL DRIVEWAYS MAY BE POURED MONOLITHIC WITH CURB AND GUTTER. COMMERCIAL DRIVEWAYS TO HAVE #4 BARS AT 18" ON CENTER LONGITUDINAL & TRANSVERSE EXTENDING INTO GUTTER PAN AND DRIVEWAY WINGS. MINIMUM 2" CONCRETE COVER FOR ALL REINFORCING BARS. WHEN COMMERCIAL DRIVEWAY APPROACH AND CURB & GUTTER IS POURED SEPARATELY, IT SHALL BE REQUIRED FOR EACH REINFORCING BAR TO BE DOWELED INTO ADJACENT CURB & GUTTER. DOWELS SHALL #4 REBAR, PENETRATE INTO CURB & GUTTER MINIMUM OF 6", SPACED AT 18" ON CENTER AND BE SECURELY TIED TO THE DRIVEWAY APPROACH REINFORCING.
5. IF JOINT EXISTS WITHIN 4 FEET OF DRIVEWAY, REMOVE SIDEWALK AND CURB AND GUTTER TO THAT JOINT.
6. ALL ADJACENT CONCRETE REMOVAL SHALL BE TO NEAT SAW CUT LINES AT RIGHT ANGLES. DOWEL INTO EXISTING ADJACENT CONCRETE DRIVEWAY APPROACH OR SIDEWALK WITH (2) No. 4 REINFORCEMENT BARS EQUALLY SPACED ACROSS WIDTH "W". DOWELS SHALL PENETRATE A MINIMUM OF 4" INTO EXISTING CONCRETE.
7. WEAKENED PLANE JOINTS SHALL BE CONSTRUCTED AT 5 FT INTERVALS AND IN ACCORDANCE WITH SECTION 312 OF THE SSPWC.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

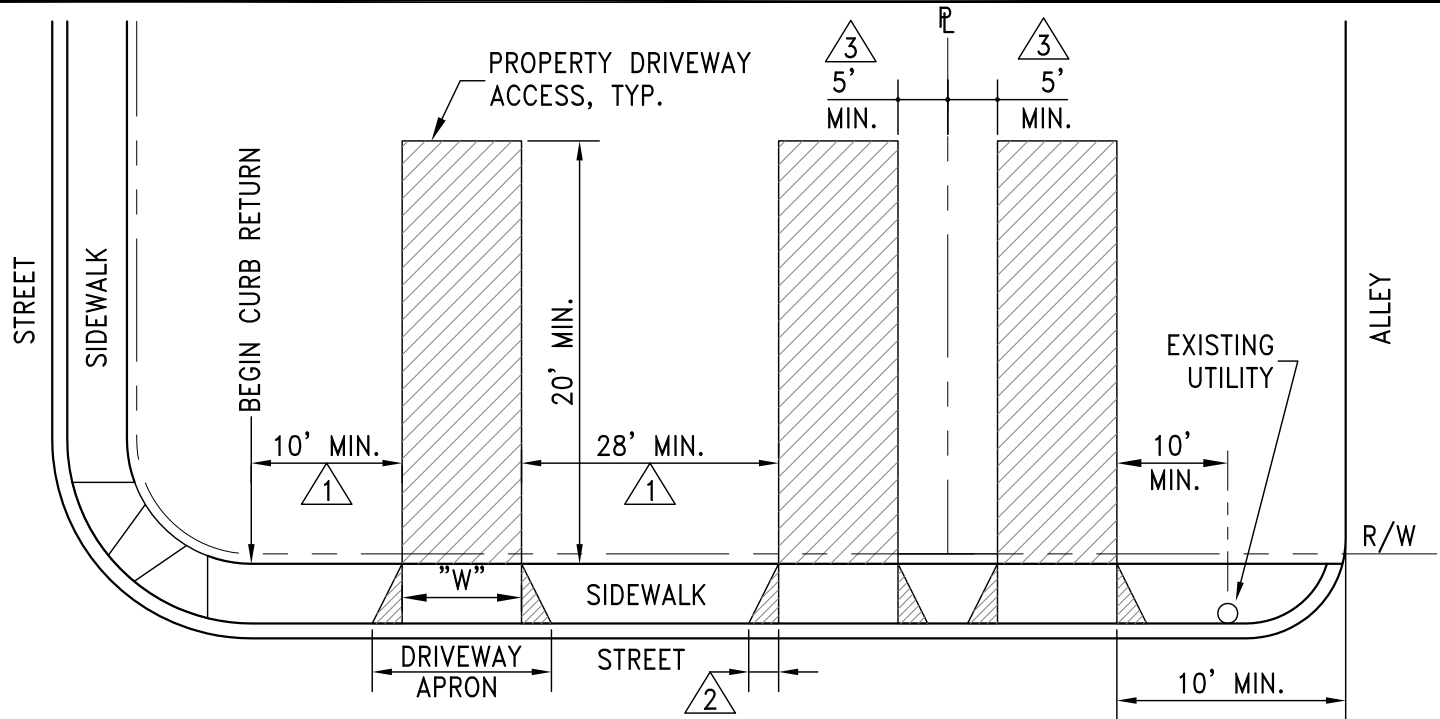
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**NOTES -**  
**P.C.C. DRIVEWAY APRON**

**R-114B**

APPROVED BY: JF

DATE: 3/2014



	RESIDENTIAL	MULTI-FAMILY LIGHT COMMERCIAL <sup>△4</sup>	HEAVY COMMERCIAL AND INDUSTRIAL <sup>△5</sup>
"W" DRIVEWAY OPENING (WIDTH)	12' MIN. 30' MAX. <sup>△7</sup>	14' MIN. (ONE-WAY) 24' MIN. (TWO-WAY) 36' MAX.	16' MIN. (ONE-WAY) 30' MIN. (TWO-WAY) 54' MAX. (HEAVY TRUCK)

**NOTES:**

- <sup>△1.</sup> COMMERCIAL COLLECTOR — 50' } REQUIRED DIMENSIONS OUTSIDE THE DOWNTOWN  
MINOR ARTERIAL — 150' } PARKING DISTRICT. VARIANCE REQUIRED WHEN  
MAJOR ARTERIAL — 235' } THIS STANDARD CANNOT BE MET.
- <sup>△2.</sup> DOWNTOWN PARKING DISTRICT TO BE APPROVED BY THE CITY ENGINEER.
- <sup>△3.</sup> DRIVEWAY WING TAPER LENGTH VARIES SEE P.C.C. DRIVEWAY APRON DETAIL  
5' MINIMUM SPACE NOT REQUIRED ON SHARED DRIVEWAYS. WHEN THIS DIMENSION BETWEEN ADJACENT DRIVEWAYS IS LESS THAN 10', SUCH AS WITH CUL-DE-SAC CONFIGURATIONS, THE CURB SHALL BE DEPRESSED BETWEEN THE DRIVEWAYS. PROPERTIES WITH COMMON INTERNAL ACCESS MAY SHARE A SINGLE DRIVEWAY WITH THE APPROPRIATE EASEMENT.
- <sup>△4.</sup> INCLUDES MULTI-RESIDENTIAL WITH 2 UNITS OR GREATER, OFFICE BUILDINGS, AND OTHER COMMERCIAL BUILDINGS.
- <sup>△5.</sup> INCLUDES DRIVE-IN ESTABLISHMENTS, FACTORIES, SERVICE STATIONS, WAREHOUSES AND DISTRIBUTION, MANUFACTURING AND INDUSTRIAL.
6. ANY DEVIATION FROM THESE DIMENSIONS MUST BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER.
- <sup>△7.</sup> THE WIDTH OF THE DEPRESSED CURB SECTION OF THE DRIVEWAY IS TO MATCH THE WIDTH OF THE LARGEST GARAGE OPENING OR THE OPENING THAT FACES THE STREET.
8. DRIVEWAYS ARE TO CONNECT PERPENDICULAR TO THE STREET CENTERLINE. ON CUL-DE-SACS, CURVED STREETS, ETC., WHERE THIS REQUIREMENT MAY NOT BE POSSIBLE, ANY DIFFERENT DRIVEWAY SHALL BE TREATED AS AN INTERSECTION AND ACCESS MANAGEMENT STANDARDS SHALL APPLY.
9. ADDITIONAL DRIVEWAY APRON WIDTH MAY BE ALLOWED TO THE PROPERTY LINE SIDE OF THE NORMAL DRIVEWAY LOCATION TO ACCOMMODATE LARGE VEHICLE ACCESS, ACCESS TO THE REAR OR SIDE YARD, ETC., BUT ONLY AS APPROVED BY THE CITY ENGINEER.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

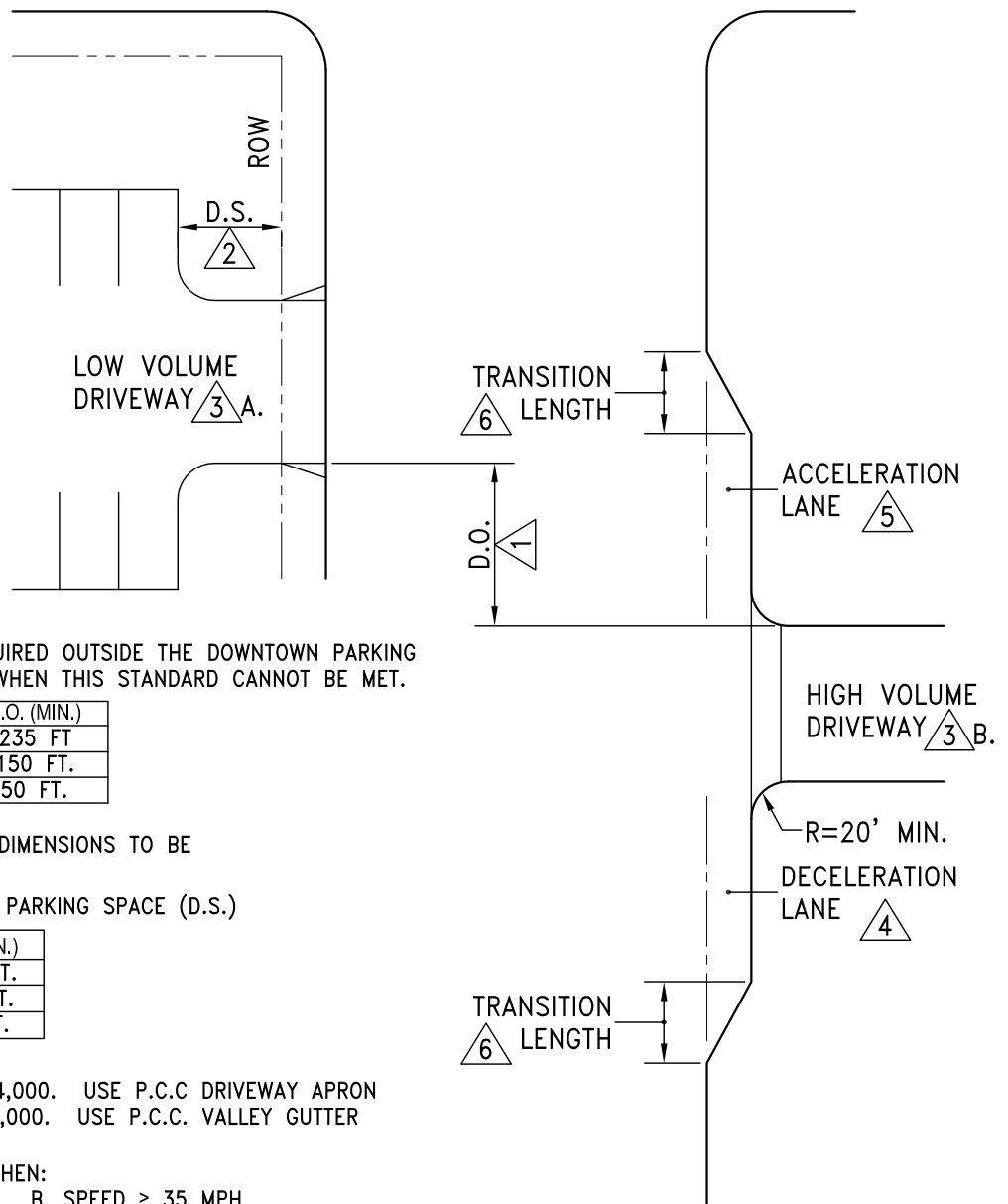
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# DRIVEWAY GEOMETRICS

R-115A

APPROVED BY: JF | DATE: 1/2013





**NOTES:**

1. DRIVEWAY OFFSET (D.O.) – REQUIRED OUTSIDE THE DOWNTOWN PARKING DISTRICT. VARIANCE REQUIRED WHEN THIS STANDARD CANNOT BE MET.

FACILITY TYPES	D.O. (MIN.)
MAJOR ARTERIALS	235 FT.
MINOR ARTERIALS	150 FT.
COMMERCIAL COLLECTORS	50 FT.

NOTE:  
DOWNTOWN PARKING DISTRICT, DIMENSIONS TO BE APPROVED BY CITY ENGINEER

2. DISTANCE FROM ROW TO FIRST PARKING SPACE (D.S.)

PROJECT ADT	D.S. (MIN.)
< 1000	25 FT.
1,000 – 10,000	50 FT.
> 10,000	100 FT.

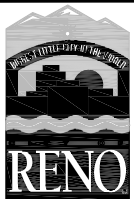
3. DRIVEWAY TYPE:  
A. PROJECT ADT < 4,000. USE P.C.C. DRIVEWAY APRON  
B. PROJECT ADT ≥ 4,000. USE P.C.C. VALLEY GUTTER

4. DECELERATION LANE REQUIRED WHEN:  
A. STREET ADT > 10,000 B. SPEED ≥ 35 MPH  
C. DRIVEWAY ADT > 1,000 D. PEAK HOUR RIGHT TURN INGRESS ≥ 40  
E. FRONTAGE > 150' F. WILL NOT RESTRICT UPSTREAM PROPERTIES

5. ACCELERATION LANE REQUIRED WHEN:  
A. STREET ADT > 10,000  
B. SPEED ≥ 45 MPH  
C. PEAK HOUR DRIVEWAY RIGHT TURN EGRESS ≥ 75  
D. FRONTAGE LONG ENOUGH TO ACCOMMODATE FULL ACCELERATION AND MERGE LENGTH

6. TRANSITION LENGTH:  
L=TRANSITION LENGTH  
W= OFFSET  
S= DESIGN SPEED  
S ≥ 45 MPH  
L = WS  
S ≤ 40 MPH  
L = WS<sup>2</sup>/60

7. ANY DEVIATION FROM THESE STANDARDS INCLUDING NDOT AND RTC MUST BE SUBMITTED TO AND APPROVED BY THE CITY ENGINEER.  
8. IF PROPERTIES ARE SHARING COMMON INTERNAL ACCESS, THEN DRIVEWAY SHALL BE TREATED AS A SINGLE DRIVEWAY WITH RECIPROCAL ACCESS EASEMENTS.



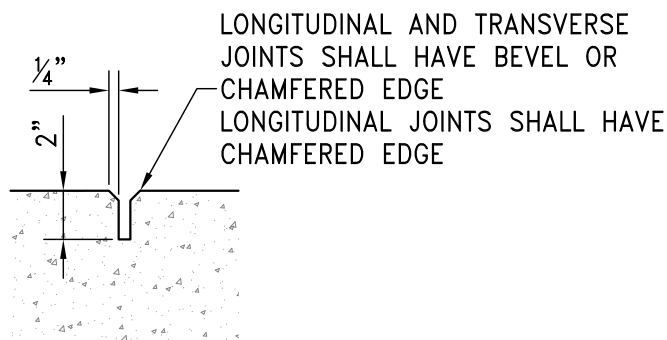
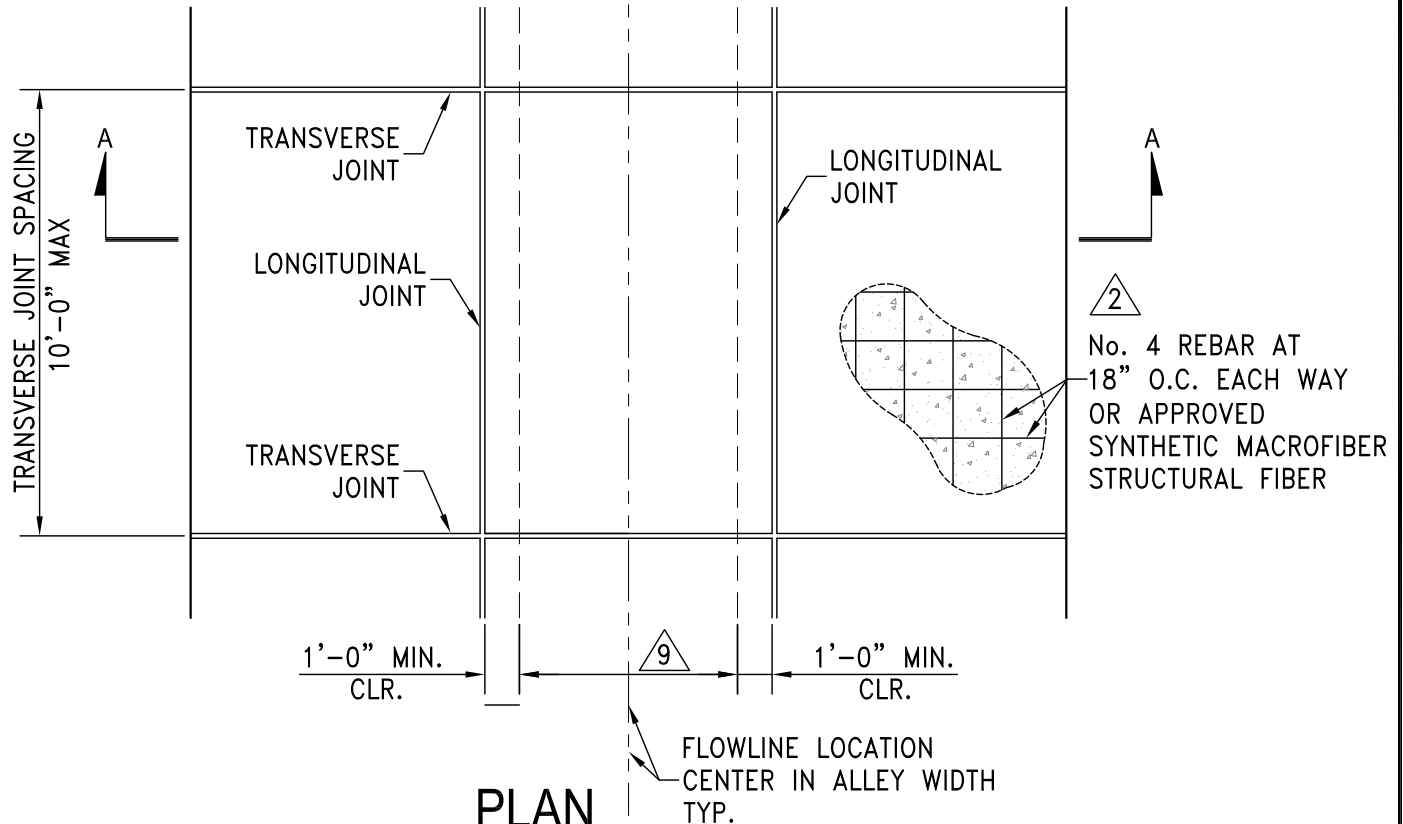
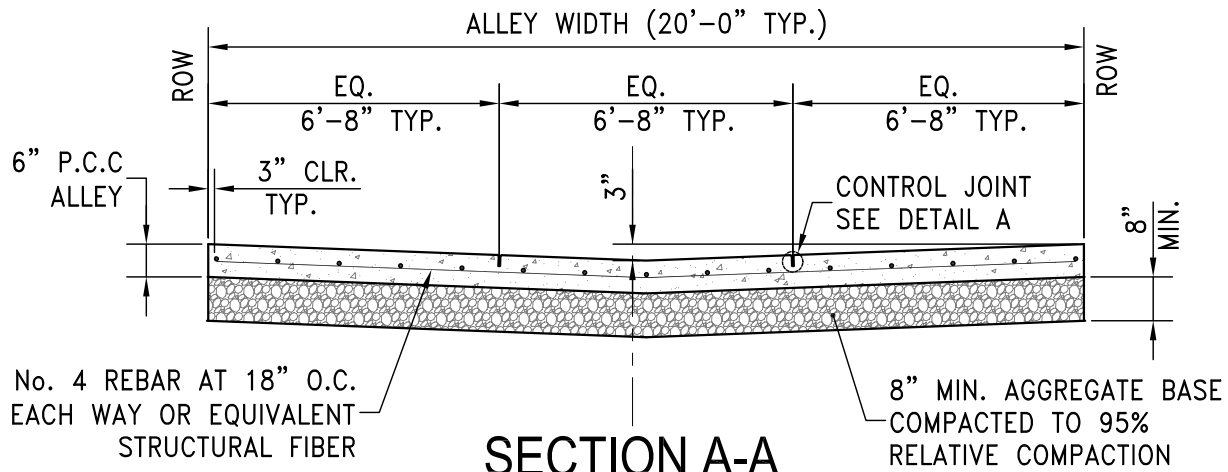
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

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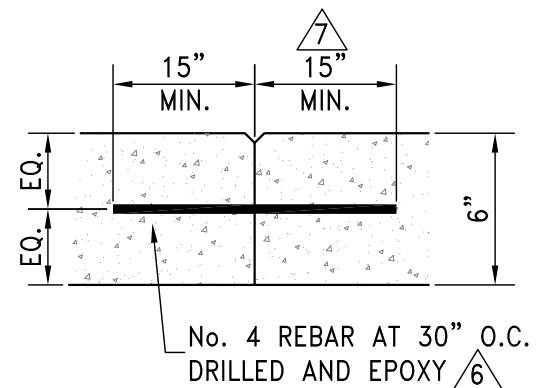
**DRIVEWAY GEOMETRICS**

**R-115B**

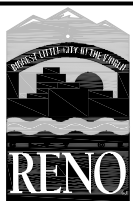
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DETAIL A (CONTROL JOINT)



DETAIL B (CONSTRUCTION JOINT)



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

P.C.C. ALLEY

DRAWING No.

R-116A

APPROVED BY: JF

DATE: 1/2013

NOTES:

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm 1.5\%$ , SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. THE SYNTHETIC MACROFIBER SHALL BE "TUF-STRAND SF" OR APPROVED EQUAL. MINIMUM FIBER DOSAGE SHALL BE 8.0 LBS./CUBIC YARD.
3. AGGREGATE BASE MATERIAL UNDER PCC ALLEY WAY SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
4. ALL ADJACENT CONCRETE REMOVAL SHALL BE TO NEAT SAW CUT LINES AT RIGHT ANGLES TO NEW CONCRETE.
5. ADJUSTMENT OF UTILITIES AND SURVEY MONUMENTS SHALL BE FLUSH WITH SLAB. UTILITIES SHALL BE A MINIMUM OF ONE FOOT AWAY FROM FLOW LINE.
6. DOWELS SHALL BE CENTERED IN THE P.C.C. SECTION AND SHALL BE PLACED PARALLEL TO THE TOP OF THE CONCRETE SURFACE WITHIN A TOLERANCE OF  $\pm \frac{1}{16}$ " IN ONE FOOT.
7. DOWELS AND TIE BARS SHALL BE DRILLED AND EPOXIED INTO ADJACENT SLAB. EXPOSED END OF DOWEL SHALL BE GREASED PRIOR TO POURING P.C.C. PAVEMENT. THE LENGTH OF THE DOWELS AND TIE BARS TO BE EMBEDDED FIFTEEN INCHES (15") INTO THE SLAB.
8. JOINTS TO BE CUT AT A MINIMUM OF 4 HOURS TO A MAXIMUM OF 12 HOURS AFTER THE CONCLUSION OF BRUSH FINISHING.
9. FLOW LINE SHALL BE CENTERED WHERE POSSIBLE, BUT MAY BE OFFSET TO IMPROVE DRAINAGE. FLOWLINE MUST REMAIN A MINIMUM 1 FOOT CLEAR FROM LONGITUDINAL JOINTS AND 1 FOOT MINIMUM CLEAR FROM EDGE OF UTILITIES.
10. INSTALL  $\frac{1}{2}$ " THICK ASPHALT FIBER EXPANSION BOARD WHERE ALLEY ABUTS BUILDINGS OR STRUCTURES.
11. FULLY WRAP POLES WITH MINIMUM  $\frac{1}{2}$ " FLEXIBLE EXPANSION JOINT.
12. CONCRETE REMOVAL SHALL BE TO AN EXISTING JOINT. PANELS SHALL BE FULL DEPTH SAWCUT TO PROVIDE A CLEAN EDGE PRIOR TO REPLACING P.C.C. ALLEY.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**NOTES -- P.C.C. ALLEY**

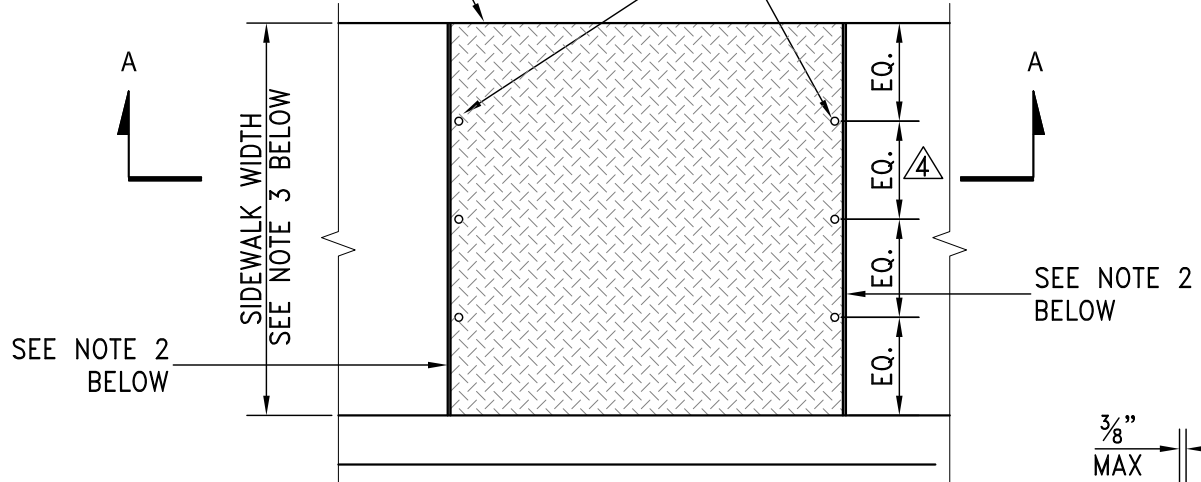
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**R-116B**

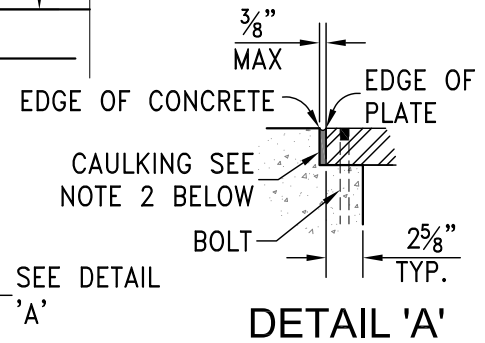
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SOLID STEEL DIAMOND PLATE  
W/ NON-SKID PATTERN  
12" WIDE X 1/2" THICK (MIN.)

BOLT PLATE TO CONCRETE WITH  $\frac{3}{8}$ " DIA.  
BEVELED HEAD BOLTS, FLUSH WITH PLATE.  
BOLT SPACING FOR 4' SIDEWALK SHOWN

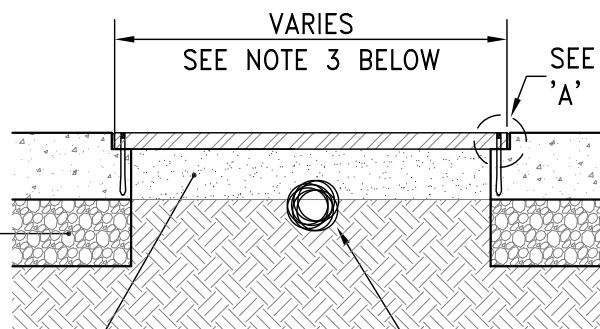


**PLAN**



**DETAIL 'A'**

4" MIN. TYPE 2, CLASS B,  
CRUSHED AGGREGATE BASE  
COMPACTED TO MINIMUM  
95% RELATIVE COMPACTION



**SECTION A-A**

PLACE DG OVER EXPOSED  
ROOT AND HAND TAMP

EXISTING TREE ROOT  
(SHOWN FOR ILLUSTRATION ONLY)

**NOTES:**

1. CONTRACTOR SHALL REMOVE ONLY THE EXISTING CONCRETE WITHIN THE ROOT MITIGATION LIMITS. THE CONTRACTOR SHALL EMPLOY AN ISA CERTIFIED ARBORIST TO PERFORM ROOT CROWN EXCAVATION / ROOT PRUNING. ISA CERTIFIED ARBORIST SHALL COORDINATE THIS WORK WITH THE CITY OF RENO URBAN FORESTER (334-2270).
2. SET PLATE FLUSH WITH ADJACENT CONCRETE AND PROVIDE  $\frac{3}{8}$ " MAX GAP BETWEEN STEEL PLATE AND EDGE OF SIDEWALK. FILL GAP WITH CAULKING AFTER PLACEMENT OF PLATE. CAULKING MATERIAL SHALL BE GE SILICONE II\* W/D SUPREME, OR APPROVED EQUAL. COLOR SHALL BE WHITE.
3. ROOT PLATE WIDTH SHALL MATCH WIDTH OF SIDEWALK. ROOT PLATE LENGTH VARIES, FINAL LENGTH SHALL BE DETERMINED IN THE FIELD BY THE CERTIFIED ARBORIST AND ENGINEER.
4. BOLTS:  $\frac{3}{8}$ " DIA x 2  $\frac{7}{8}$ " LONG DYNABOLT SLEEVE ANCHOR RAMSET REDHEAD FS-3826 OR APPROVED EQUAL. SIDEWALK WIDER THAN 4FT, BOLTS SHALL BE PLACED AT 18" O.C. FOR WIDTH OF SIDEWALK.
5. CONTRACTOR SHALL PROTECT TREES AT ALL TIMES, INCLUDING BUT NOT LIMITED TO TRUNKS, LIMBS AND ROOTS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH REPAIR OR REMOVAL OF DAMAGED TREES DUE TO CONSTRUCTION ACTIVITIES.



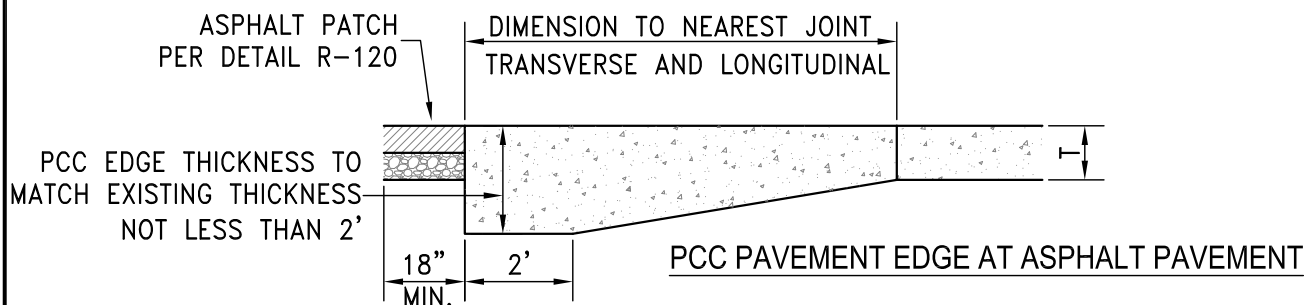
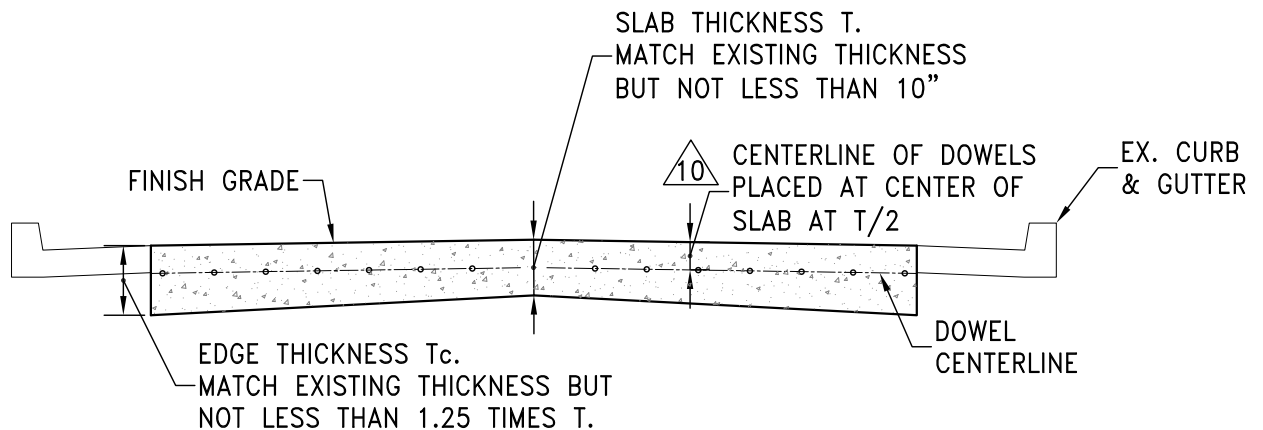
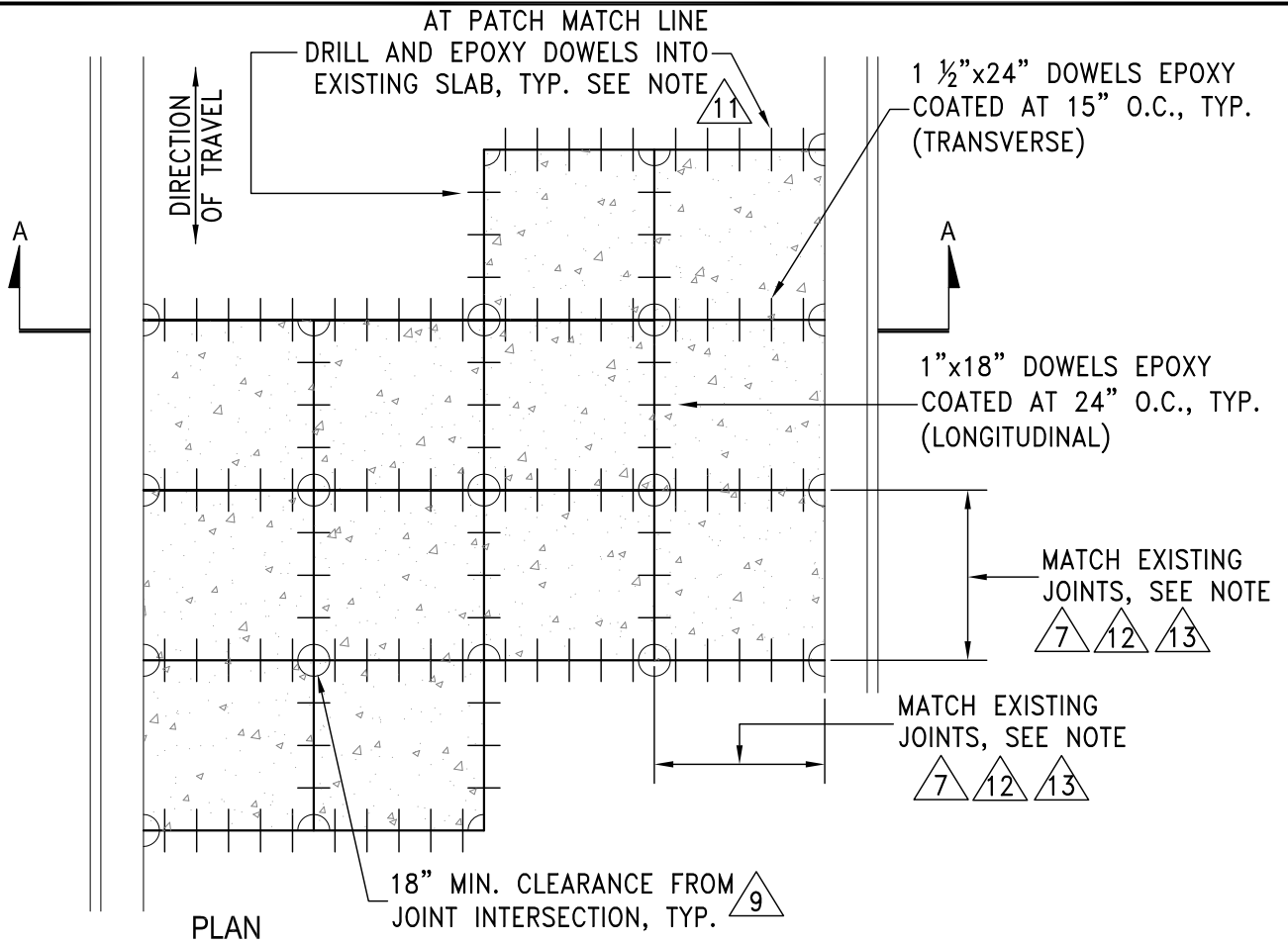
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# SIDEWALK PLATE FOR TREE ROOT CLEARANCE

DRAWING No.

R-117

APPROVED BY: JF | DATE: 1/2013



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

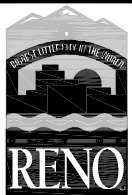
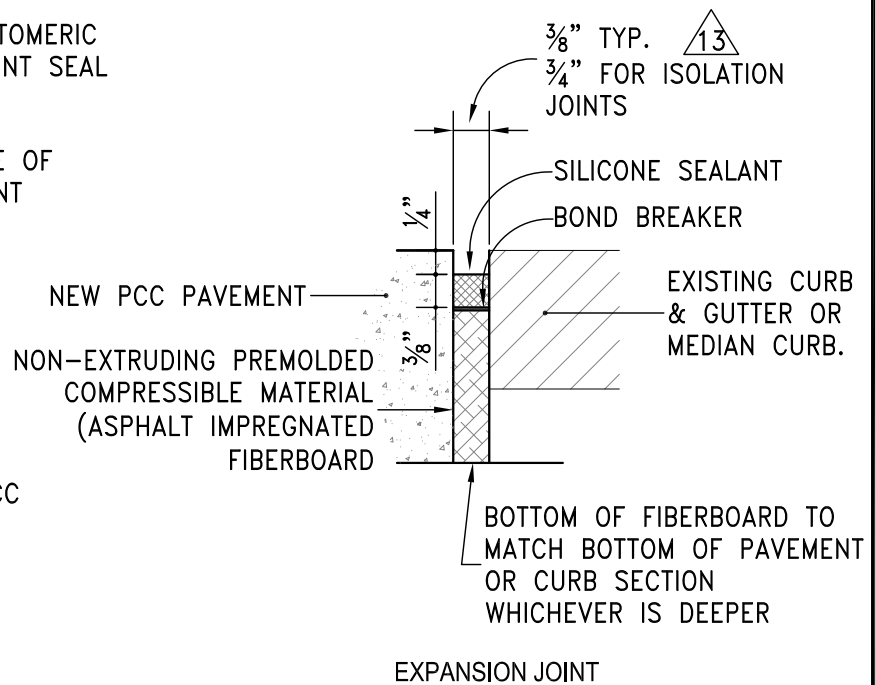
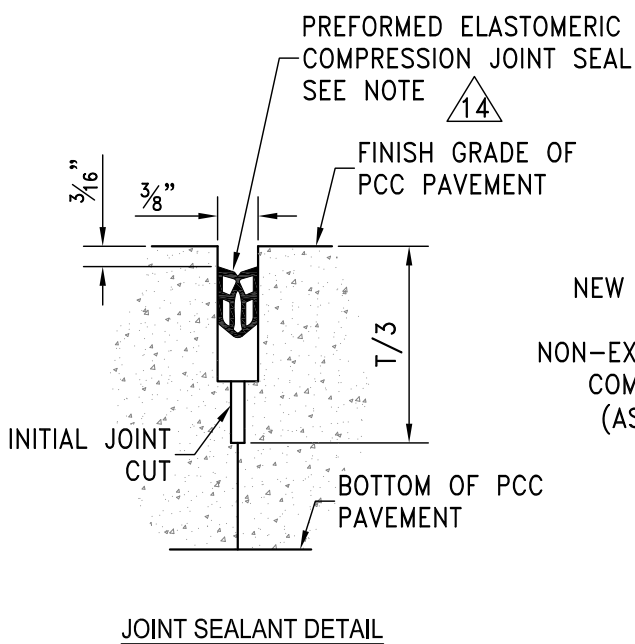
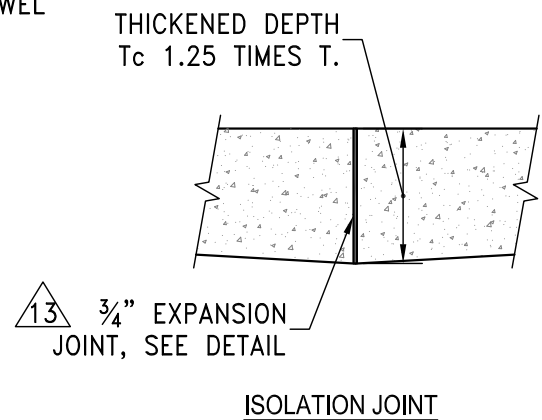
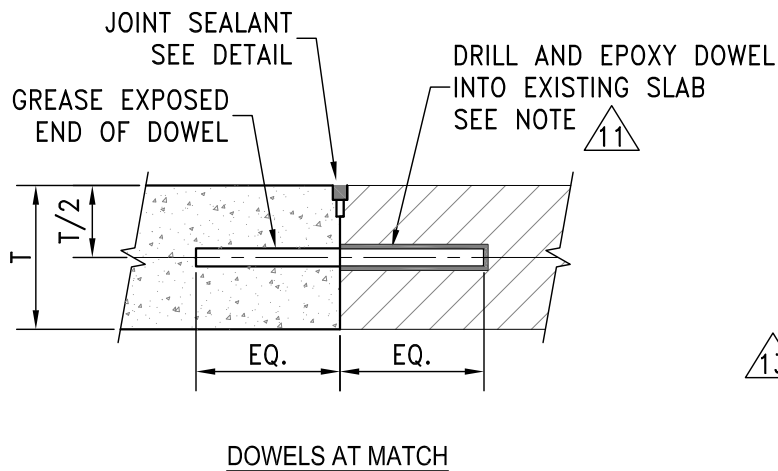
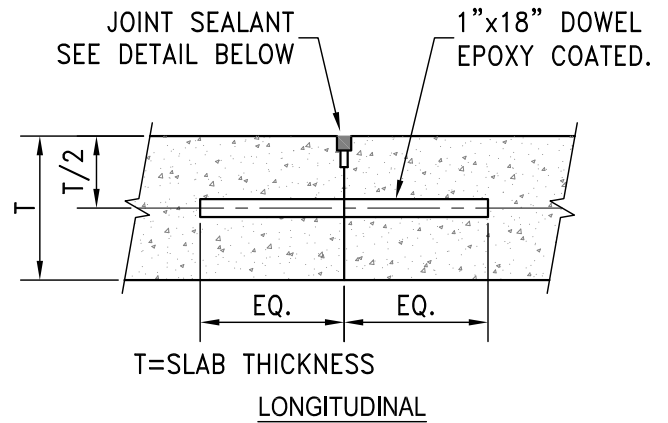
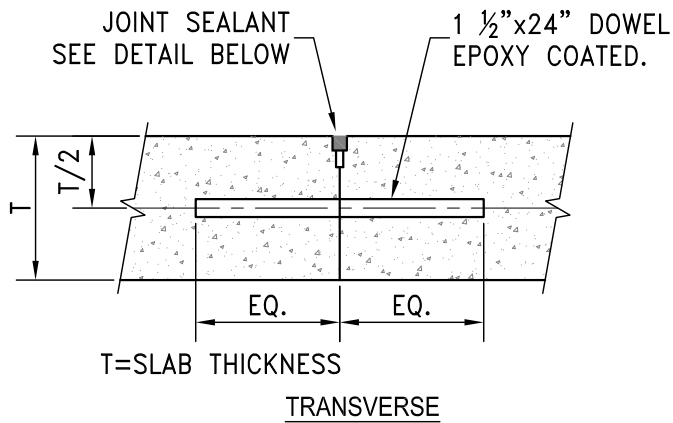
# CONCRETE PAVEMENT PATCH

DRAWING No.

R-119A

APPROVED BY: JF

DATE: 8/2014



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION








# DETAILS -- CONCRETE PAVEMENT PATCH

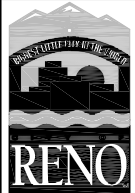
DRAWING No.

R-119B

APPROVED BY: JF DATE: 8/2014

**NOTES:**

1. A PERMIT MUST BE OBTAINED FROM THE CITY ENGINEER PRIOR TO CUTTING ANY PUBLIC RIGHT-OF-WAY. 24 HOURS PRIOR TO TRENCH EXCAVATION, THE PERMITTEE MUST NOTIFY THE CITY EXCAVATION PERMIT INSPECTOR OR APPLICABLE ENGINEER OF RECORD.
2. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, LATEST REVISION. SEE DETAIL R-122 FOR TRENCH EXCAVATION AND BACKFILL REQUIREMENTS.
3. NO CONCRETE SHALL BE PLACED UNTIL FORMS AND SUBGRADE ARE INSPECTED BY THE CITY EXCAVATION PERMIT INSPECTOR OR APPLICABLE ENGINEER OF RECORD.
4. PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 550 PSI MIN. FLEXURAL STRENGTH PRIOR TO OPENING TO TRAFFIC, MAXIMUM WATER/CEMENT RATIO OF 0.45, AIR ENTRAINMENT OF 5.5%  $\pm$ 1.5%, SLUMP AT 2 INCHES MAX. UNPLASTICIZED. ALL MATERIALS SHALL CONFORM TO SSPWC.
5. CONCRETE REMOVAL SHALL BE TO AN EXISTING JOINT. PANELS SHALL BE FULL DEPTH SAWCUT TO PROVIDE A CLEAN EDGE PRIOR TO PLACING P.C.C. PAVEMENT PATCH.
6. TUNNELING UNDER CURB, GUTTER OR SIDEWALK IS NOT PERMITTED. COMPLETE REMOVAL IS REQUIRED TO THE NEAREST CONSTRUCTION OR EXPANSION JOINT OUTSIDE THE TRENCH WIDTH, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
7.  JOINT SPACING SHALL MATCH EXISTING JOINT SPACING, EXCEPT THAT MAXIMUM SPACING SHALL NOT BE MORE THAN 15' IN ANY DIRECTION, UNLESS APPROVED BY THE CITY ENGINEER.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR PLACEMENT OF LOOP DETECTORS, ADJUSTMENT OF UTILITIES AND SURVEY MONUMENTS TO GRADE AND INSTALLATION OF PAVEMENT MARKINGS.
9.  DOWEL BARS SHALL NOT BE PLACED WITHIN 18" OF OPPOSING JOINT.
10.  THE ALIGNMENT AND ELEVATION OF DOWELS IS EXTREMELY IMPORTANT. DOWELS SHALL BE CENTERED IN THE P.C.C. SECTION AND SHALL BE PLACED PARALLEL TO THE TOP OF THE PAVEMENT SURFACE WITHIN A TOLERANCE OF  $\pm$ 1/16" IN ONE FOOT.
11.  DOWEL BARS SHALL BE DRILLED AND EPOXIED INTO ADJACENT SLAB. EXPOSED END OF DOWEL SHALL BE GREASED PRIOR TO POURING P.C.C. PAVEMENT. THE LENGTH OF THE DOWELS TO BE EMBEDDED INTO THE SLAB SHALL BE HALF THE TOTAL LENGTH OF DOWEL BARS.
12.  P.C.C. PAVEMENT SLABS WITH A LENGTH TO WIDTH RATIO GREATER THAN 1.25:1 SHALL BE REINFORCED WITH 6"x6" W2XW2 WELDED WIRE FABRIC OR NO. 3 BARS SPACED AT 12" O.C. EACH WAY.
13.  3/8" EXPANSION JOINT MATERIAL SHALL BE PLACED ADJACENT TO CURB AND GUTTER SECTIONS. 3/4" EXPANSION JOINT MATERIAL SHALL BE PLACED ADJACENT TO UTILITIES AND OTHER ISOLATION JOINTS.
14.  INITIAL JOINTS CUT SHALL BE PREFORMED WITHIN 24 HOURS OF CONCRETE PLACEMENT. COMPRESSION SEAL CUTS SHALL BE CLEANED OUT WITH COMPRESSED AIR PRIOR TO PLACEMENT OF SEAL. COMPRESSION JOINT SEAL SHALL BE D.S. BROWN'S DB-1516 DELCRETE OR APPROVED EQUAL, INSTALLED PER MANUFACTURERS RECOMMENDATIONS.
15. P.C.C. PAVEMENT AND CURB AND GUTTER SHALL NOT BE MONOLITHIC.
16. ASPHALT BASED HOT POUR SEALANTS SHALL NOT BE USED, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.



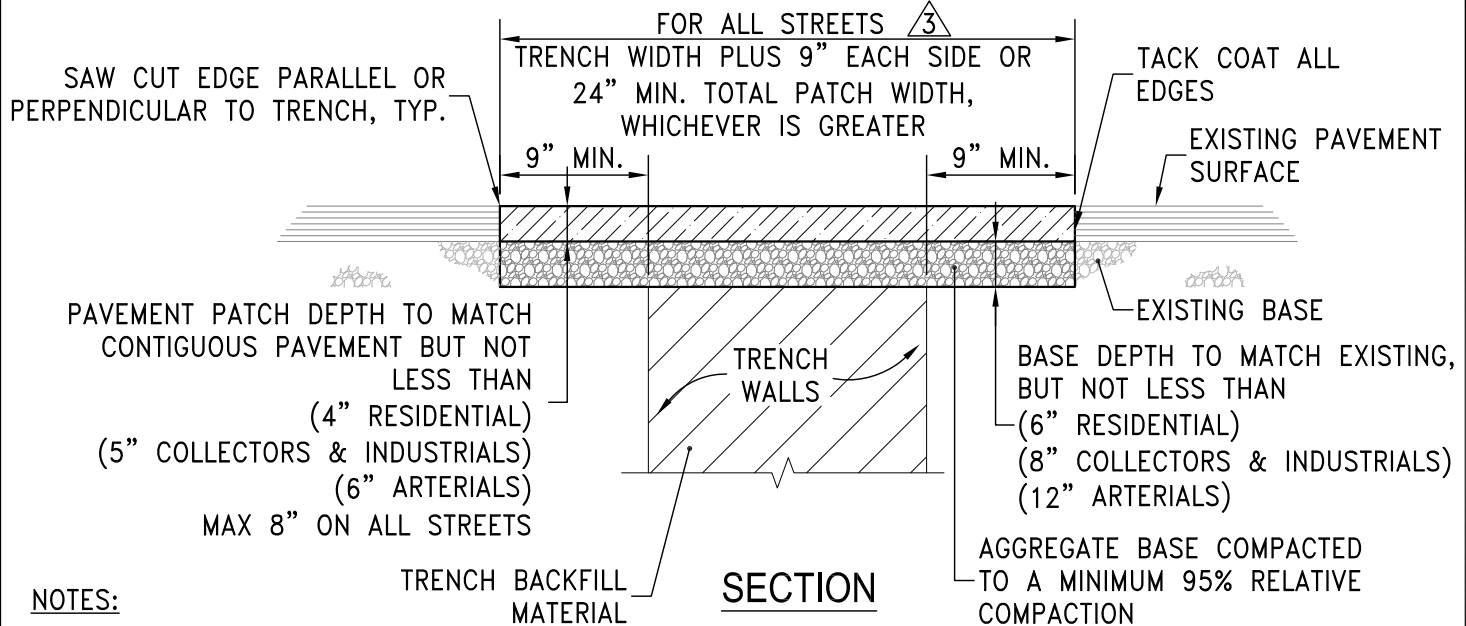
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**NOTES - CONCRETE  
PAVEMENT PATCH**

DRAWING No.

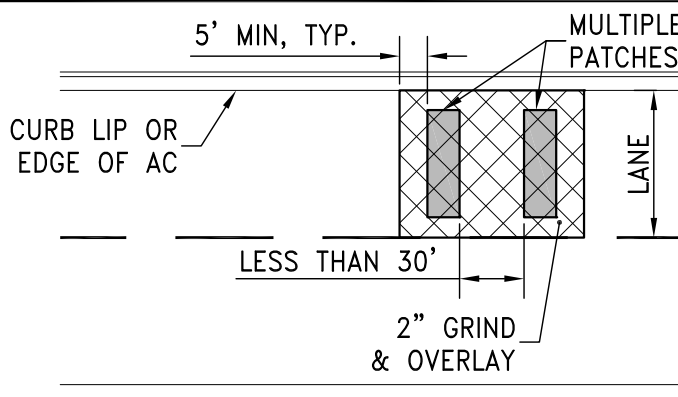
**R-119C**

APPROVED BY: JF | DATE: 8/2014

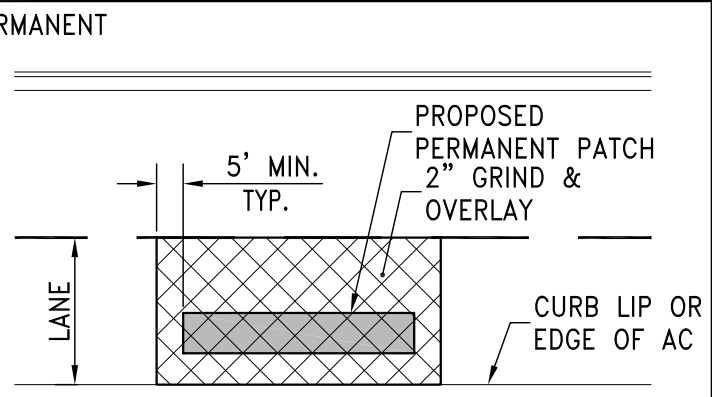


**NOTES:**

1. AN EXCAVATION/ENCROACHMENT PERMIT MUST BE OBTAINED FROM CITY OF RENO PRIOR TO CUTTING ANY PUBLIC RIGHT-OF-WAY.
2. IF SAW CUT IS WITHIN 2 FEET OF AN EXISTING PAVEMENT EDGE OR EXISTING PAVEMENT PATCH, REMOVE EXISTING PAVEMENT TO THAT EDGE AND REPLACE ENTIRE SECTION.
3. ALL PERMANENT PATCH REPLACEMENT REQUIREMENTS ARE MINIMUM WIDTHS ONLY AND INCLUDES ALL AREAS WHERE THE ASPHALT PAVEMENT HAS BEEN UNDERMINED. THE CITY ENGINEER MAY REQUIRE WIDER PATCH SECTIONS OR OTHERWISE ALTER THESE REQUIREMENTS.
4. AGGREGATE BASE MATERIAL UNDER BITUMINOUS PAVEMENT PATCH SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
5. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACEMENT OF LOOP DETECTORS, ADJUSTMENT OF UTILITIES AND SURVEY MONUMENTS TO GRADE AND INSTALLATION OF PERMANENT PAVEMENT MARKINGS.
6. FOR P.C.C. CURB REPLACEMENT, SAW CUT EXISTING PAVEMENT 18 INCHES MIN. FROM GUTTER LIP LINE, REMOVE AND REPLACE PAVEMENT TO SAW CUT EDGES. CONCRETE MAY BE POURED NEAT AGAINST EXISTING EDGE OF ASPHALT IF APPROVED BY CITY ENGINEER.



**7 TRANSVERSE PATCHING**



**8 LONGITUDINAL PATCHING**

ALL STREETS WITH PAVEMENT CONDITION INDEX (PCI) GREATER THAN 65:

7. TRANSVERSE PATCHES SHALL INCLUDE A 2" GRIND AND OVERLAY WHEREVER THERE ARE MULTIPLE PATCHES WITHIN 30 FEET OF EACH OTHER.
8. LONGITUDINAL PATCHES SHALL INCLUDE 2" GRIND AND OVERLAY TO THE LANE LINES (BIKE, PARKING, OR TRAVEL).



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

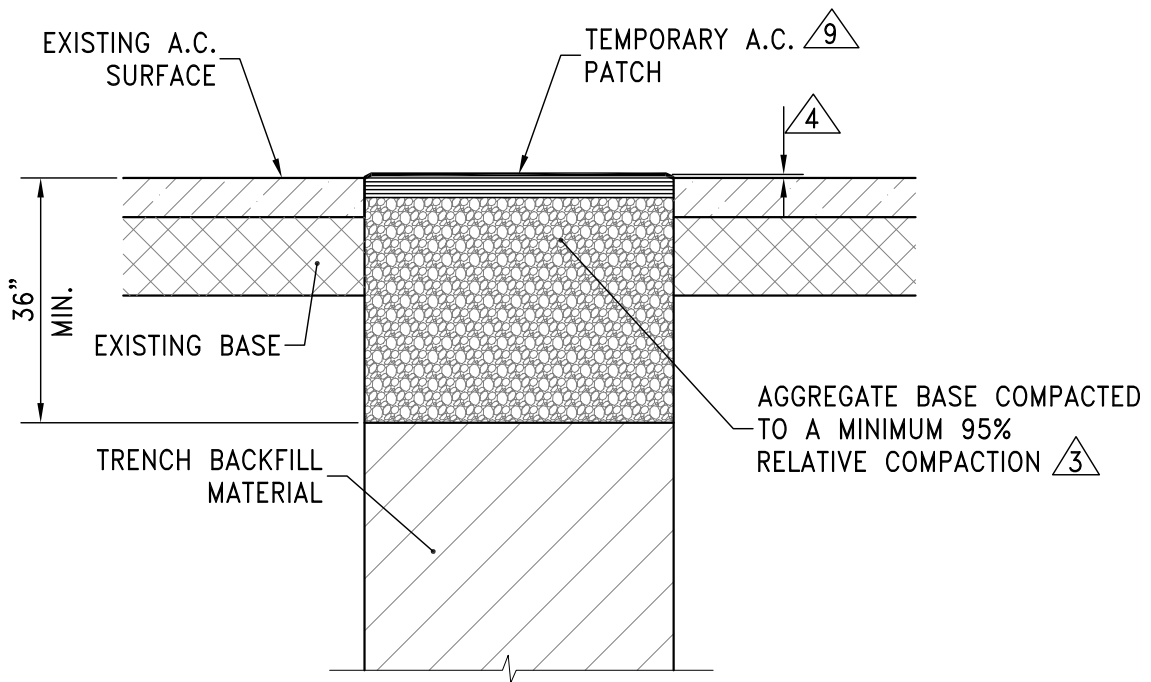
# PERMANENT BITUMINOUS PAVEMENT PATCH

DRAWING No.

R-120

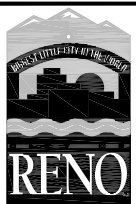
APPROVED BY: JF DATE: 1/2013





**NOTES:**

1. PRIOR TO EXCAVATION, THE OUTLINE OF THE TRENCH SHALL BE VERTICALLY CUT FULL DEPTH THROUGH THE EXISTING ASPHALT SURFACE.
2. CARE SHALL BE EXERCISED TO PREVENT SLOUGHING AND OVERBREAK. IF THE TRENCH SLOUGHS, THE SURFACE SHALL BE WIDENED TO ELIMINATE THE UNDERMINED SECTION OF ASPHALT.
3. AGGREGATE BASE UNDER TEMPORARY PATCH SHALL BE A MINIMUM THICKNESS OF 36 INCHES BELOW THE EXISTING AC SURFACE. AGGREGATE BASE MATERIAL UNDER TEMPORARY PATCH SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
4. TEMPORARY PATCHES SHALL BE PLACED AND COMPACTED. THE COMPACTED PATCH SHALL BE APPROXIMATELY 1/8" TO 1/4" ABOVE THE LEVEL OF THE ADJACENT PAVEMENT. IF NOT PATCHED WITHIN 24 HOURS AFTER BACKFILLING, THE CITY MAY PATCH AND BACK-CHARGE THE PERMITTEE FOR ALL COSTS.
5. COMPACTION OF BACKFILL, BASE AND A.C. TEMPORARY PATCH SHALL BE PERFORMED WITH APPROVED MECHANICAL TAMPERS. EQUIPMENT WHEEL ROLLING IS NOT PERMITTED.
6. ENTIRE AREA SHALL BE CLEANED OF ALL DIRT, DUST, DEBRIS, ETC. BEFORE LEAVING SITE. ANY SITE LEFT UNCLEANED WILL BE CLEANED BY THE CITY AND ALL COSTS BACK-CHARGED TO THE CONTRACTOR.
7. ALL EXCAVATIONS SHALL BE COMPLETE OR BACKFILLED AT THE END OF THE DAY.
8. TEMPORARY PATCH WORK AND PATCH MAINTENANCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
9. ALL TEMPORARY PATCHES ON ALL STREETS SHALL BE HOT-MIX ASPHALT A MINIMUM OF 3" THICK.



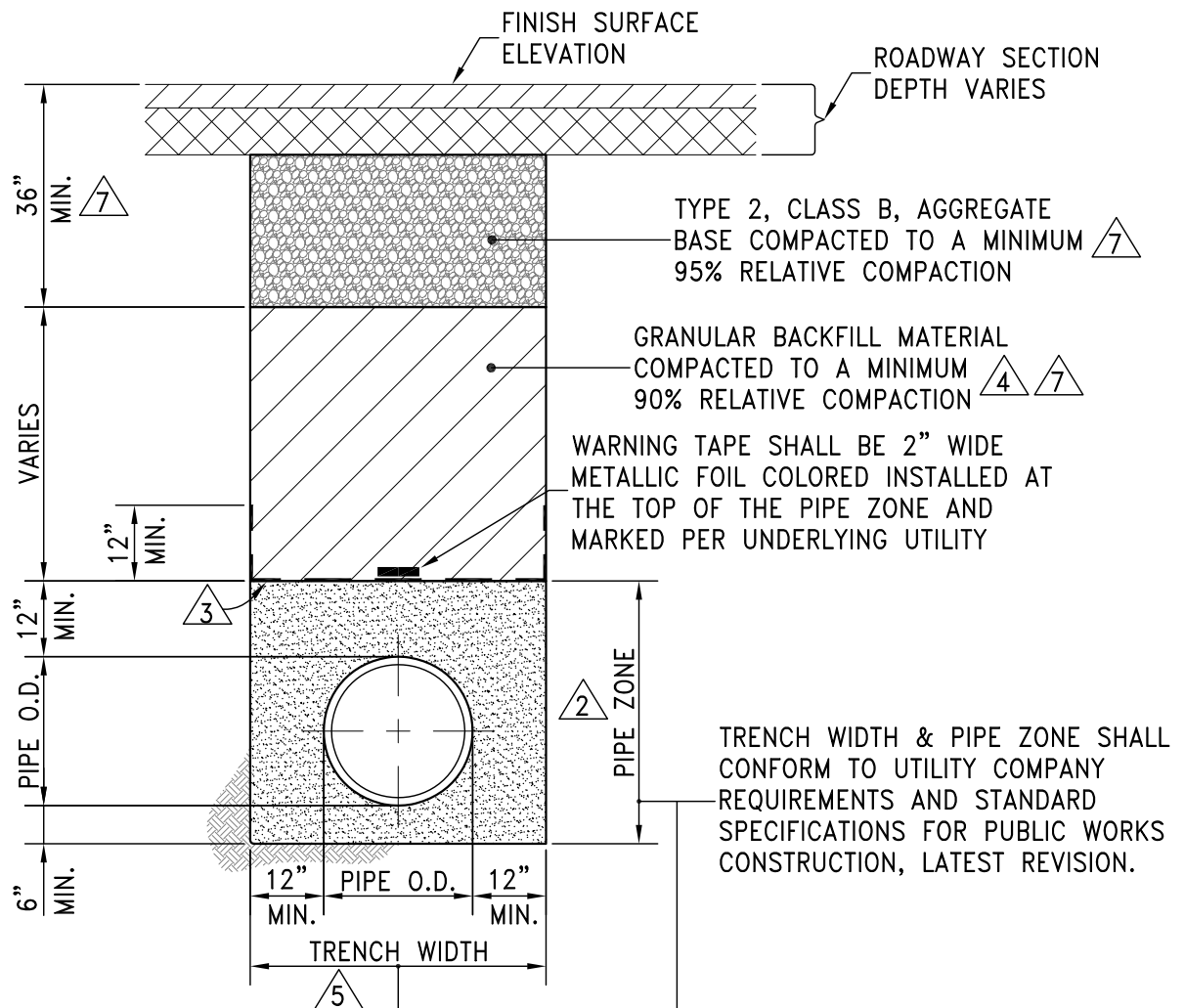
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# TEMPORARY A.C. TRENCH PATCH

DRAWING No.

R-121

APPROVED BY: JF | DATE: 1/2013



#### NOTES:

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC), LATEST REVISION.
2. BEDDING MATERIAL SHALL CONFORM TO OWNING-UTILITY COMPANY REQUIREMENTS AS APPROVED BY THE CITY OF RENO. FOR CITY-OWNED UTILITIES, BEDDING MATERIAL SHALL BE CLASS A OR C, COMPACTED TO MINIMUM 90% RELATIVE COMPACTION. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. CLASS C BEDDING REQUIRES INSTALLATION OF GEOTEXTILE FABRIC BETWEEN PIPE ZONE AND BACKFILL MATERIAL. GEOTEXTILE FABRIC SHALL BE MIRAFI 180N OR APPROVED EQUAL.
4. BACKFILL MATERIAL SHALL BE TYPE 2, CLASS B OR CLASS E AND COMPACTED TO MINIMUM 90% RELATIVE COMPACTION. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
5. ALL EXCAVATIONS SHALL CONFORM TO THE LATEST O.S.H.A. REQUIREMENTS.
6. EXISTING PIPE TO BE ABANDONED SHALL BE GROUT FILLED OR COMPLETELY REMOVED.
7. MINIMUM BACKFILL DEPTH REQUIREMENT IS FOR TRENCHING IN EXISTING PAVED STREETS. TRENCHING FOR NEW DEVELOPMENT WHERE STREETS HAVE NOT YET BEEN CONSTRUCTED, BACKFILL MATERIAL SHALL BE TYPE 2, CLASS B OR CLASS E AND COMPACTED TO MINIMUM 90% RELATIVE COMPACTION. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

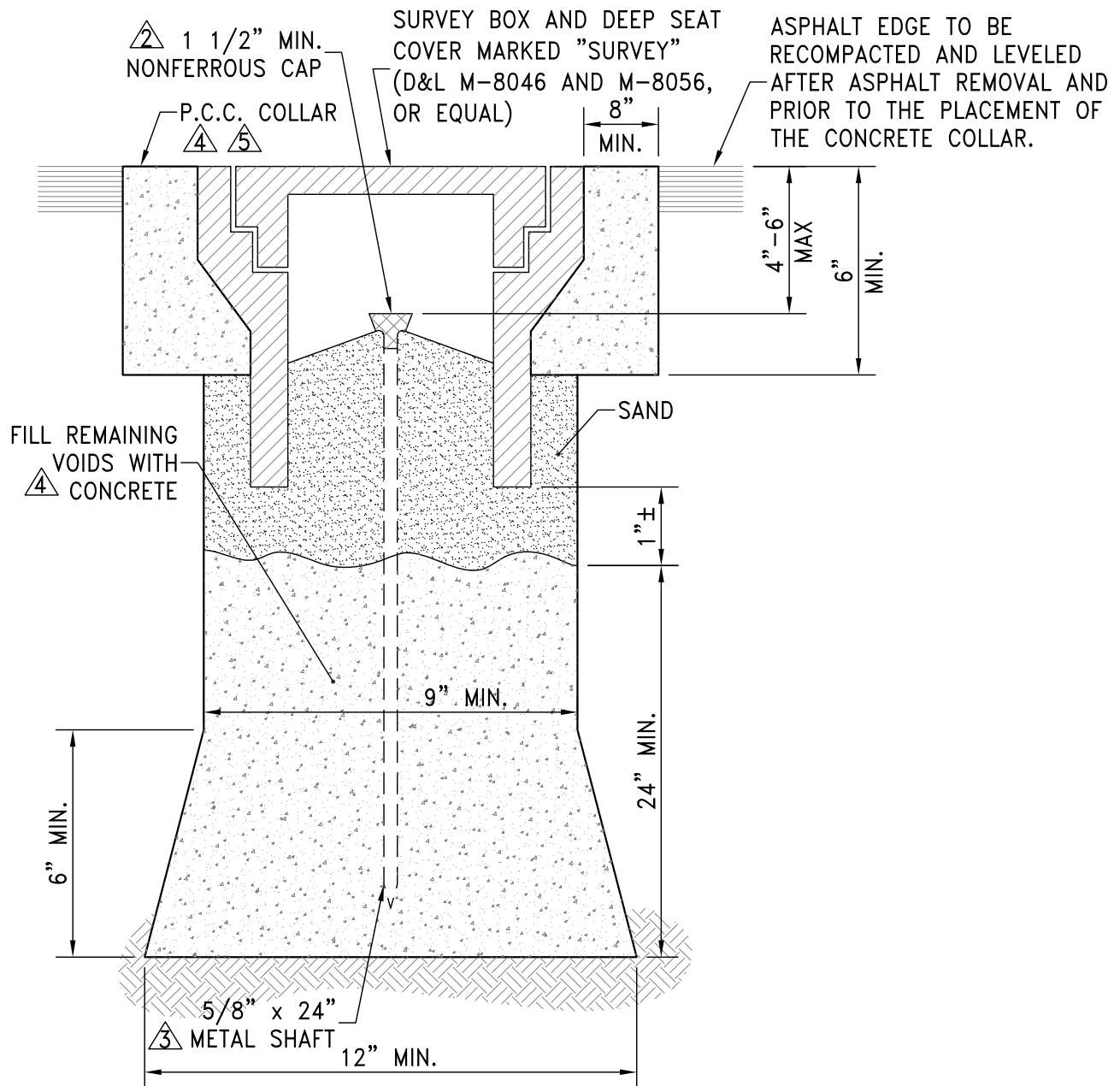
## TRENCH EXCAVATION/BACKFILL

DRAWING No.

R-122

APPROVED BY: JF

DATE: 3/2014



**NOTES:**

1. FERROUS METAL OVER MONUMENT FOR RECOVERY BY DIP NEEDLE OR MAGNETIC INSERT IN CAP.
2. 1 1/2" MIN. NONFERROUS CAP WITH PROFESSIONAL LAND SURVEYOR NO. PERMANENTLY ATTACHED PRIOR TO PLACEMENT. PRE-PUNCHED CAPS SHALL NOT BE PERMITTED
3. 5/8" METALLIC SHAFT (SMOOTH SHAFTS TO BE DEFORMED).
4. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6% ±1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
5. P.C.C. COLLARS IN ALL ROADWAYS SHALL BE PROTECTED FROM TRAFFIC LOADS UNTIL MINIMUM 3000 PSI IS ATTAINED.



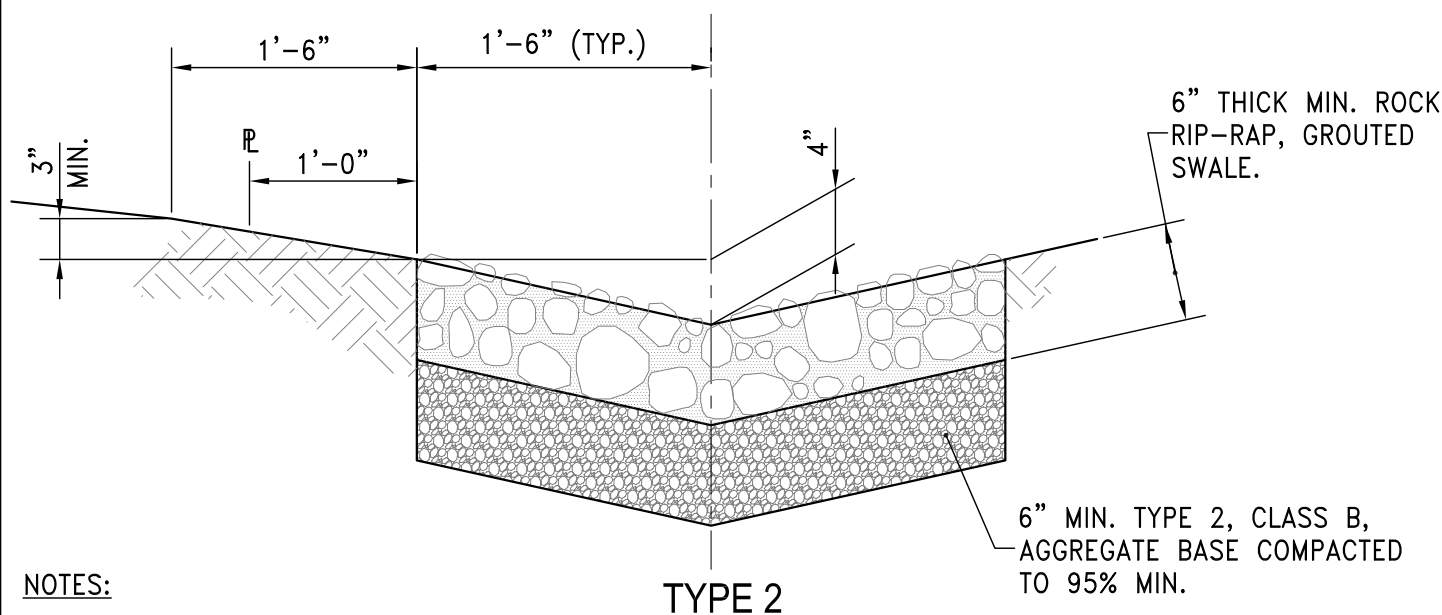
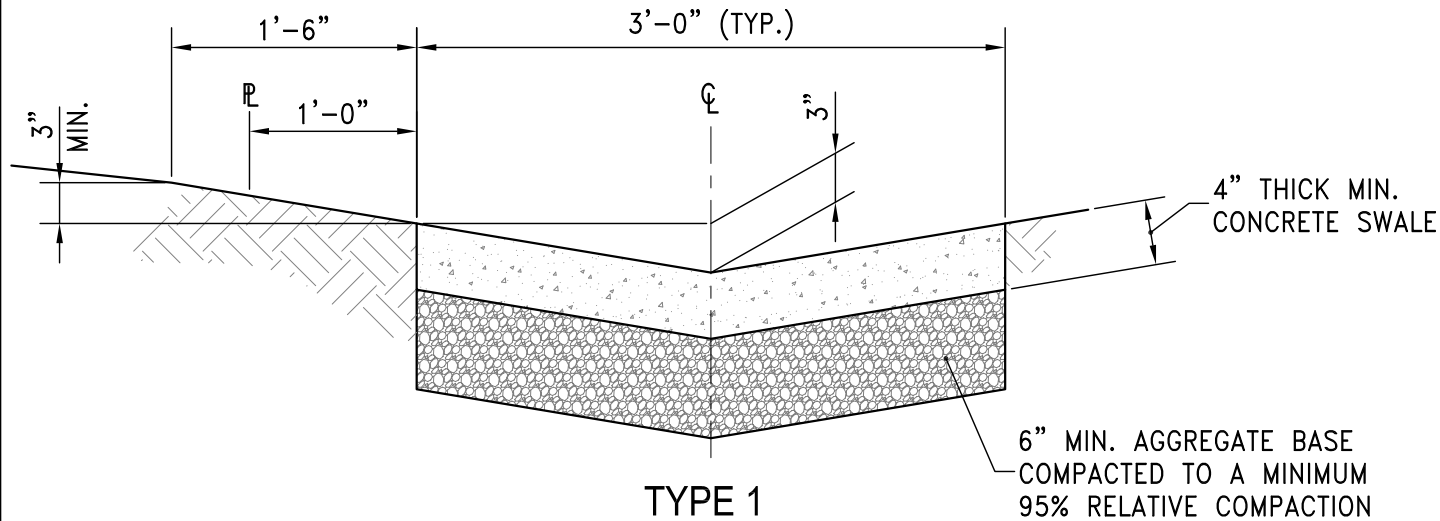
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# MONUMENTS

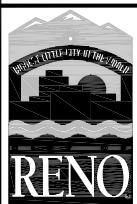
R-124

APPROVED BY: JF DATE: 1/2013



**NOTES:**

1. MAXIMUM DRAINAGE AREA SHALL BE 6 LOTS.
2. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
3. AGGREGATE BASE MATERIAL UNDER SIDEWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
4. MAXIMUM FLOWLINE GRADE FOR A TYPE I SHALL BE 6%.
5. MAXIMUM CHANGE IN HORIZONTAL ALIGNMENT SHALL BE 10 DEGREES.
6. P.C.C. DRAINAGE SWALES SHALL HAVE EXPANSION JOINTS EVERY 30 FEET AND WEAKENED PLANE JOINTS EVERY 10 FEET.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

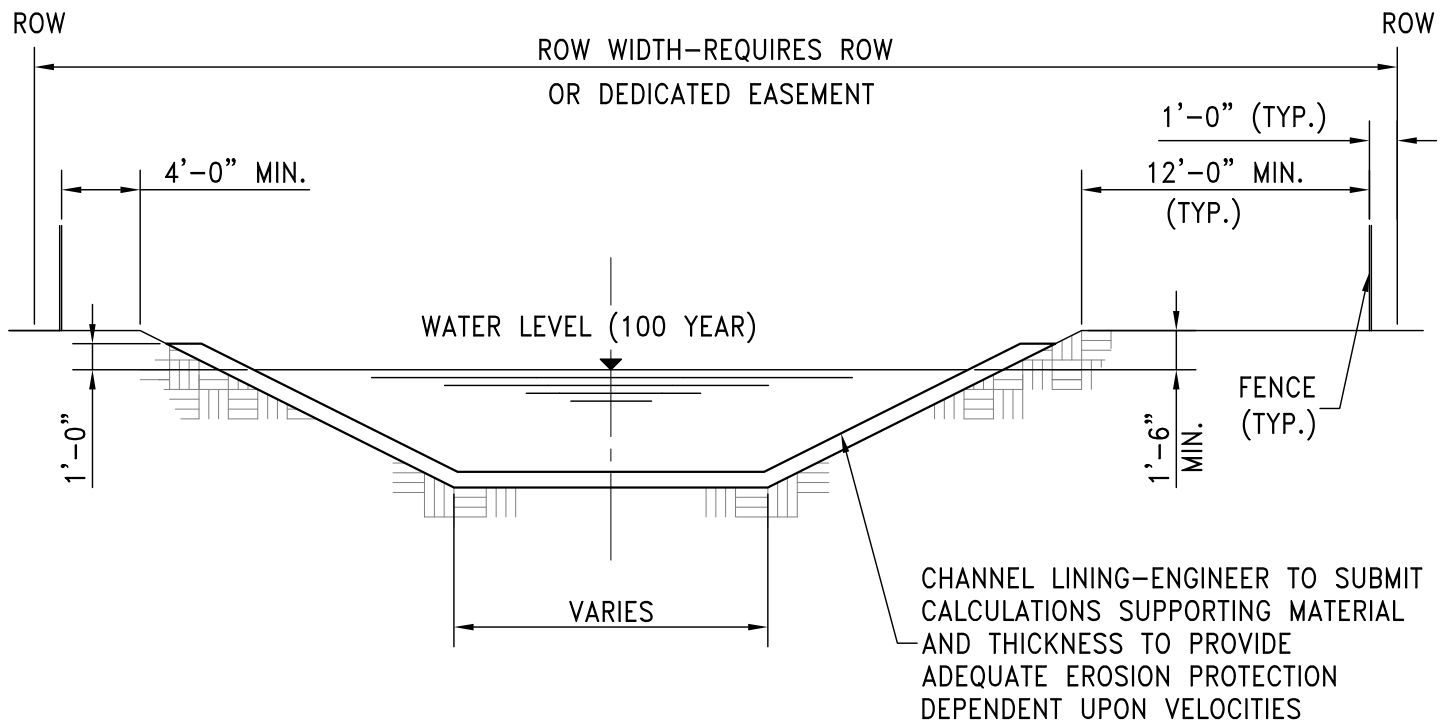
DRAWING No.

**LOT LINE  
DRAINAGE SWALE**

**R-201**

APPROVED BY: JF

DATE: 1/2013



### TYPICAL SECTION

#### NOTES:

1. REFER TO THE CITY OF RENO'S "PUBLIC WORKS DESIGN MANUAL" FOR MORE DETAILED DESIGN CRITERIA PERTAINING TO THIS DRAINAGE CHANNEL.
2. DESIGN VELOCITIES LESS THAN 6 FPS: CHANNEL LINING OF NON-ERODING, LONG LIFE, LOW MAINTENANCE MATERIAL AS APPROVED BY THE CITY ENGINEER. SIDE SLOPES 3:1 MAXIMUM UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
3. DESIGN VELOCITIES 6 TO 10 FPS: CHANNEL LINING OF LOOSE ROCK RIP-RAP SIZED FOR VELOCITY. SIDE SLOPES 2:1 MAXIMUM.
4. DESIGN VELOCITIES GREATER THAN 10 FPS: CHANNEL LINING OF CONCRETE OR AN ENGINEERED EQUIVALENT. SIDE SLOPES 1:1 MAXIMUM.
5. PAVED ACCESS ROAD(S) SHALL BE CONSTRUCTED TO CITY STANDARDS WHEN DETERMINED NECESSARY BY THE CITY ENGINEER.
6. VEHICULAR ACCESS TO THE CHANNEL FLOOR FOR MAINTENANCE SHALL BE PROVIDED.
7. IF GROUTED RIP-RAP IS USED, ROCK GREATER THAN  $D_{50}$  OF 3" SHALL BE WET SET.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## MAJOR DRAINAGE CHANNEL

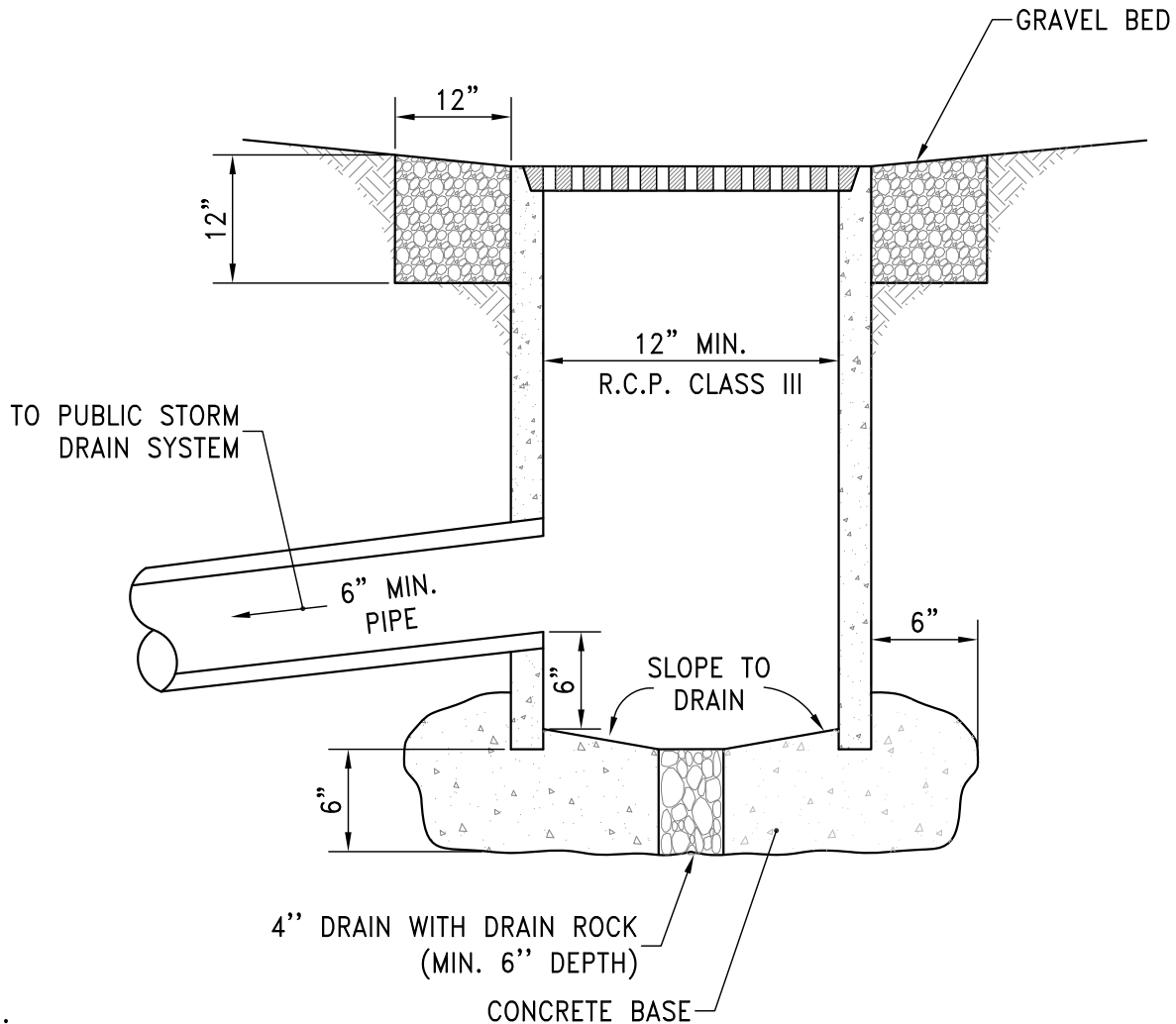
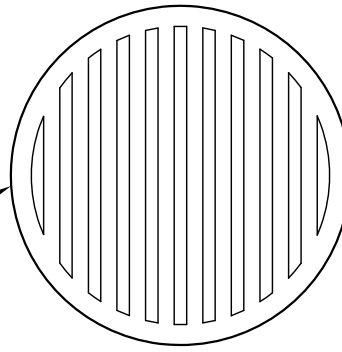
DRAWING No.

R-202

APPROVED BY: JF DATE: 1/2013

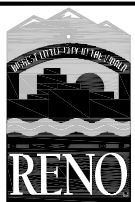
NEENAH DRAINAGE GRATE R-4380  
OR R-4385, D&L C-1012, OR  
APPROVED EQUIVALENT.

NEENAH DRAINAGE GRATE R-4351  
(BEEHIVE) MAY BE USED IN  
LANDSCAPE AREAS.



NOTES:

1. YARD DRAIN BASE SHALL BE PORTLAND CEMENT CONCRETE (P.C.C.) AND SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH A SLUMP AT 1 TO 4 INCHES. ALL MATERIALS SHALL CONFORM TO SSPWC SECTION 202.
2. TO BE OWNED AND MAINTAINED BY PRIVATE DEVELOPMENTS ONLY. NOT TO BE USED IN DRIVEWAYS OR WHERE DRAINAGE ORIGINATES FROM AREAS USED FOR VEHICULAR TRAFFIC.
3. ALL CATCH BASINS, PUBLIC OR PRIVATE, SHALL BE PROVIDED WITH A "SUR-TRAP" OIL/WATER SEPARATOR OR APPROVED EQUAL.
4. 12 INCH WIDE GRAVEL BED AROUND GRATE. NOMINAL AGGREGATE SIZE SHALL BE GREATER THAN GRATE OPENING.



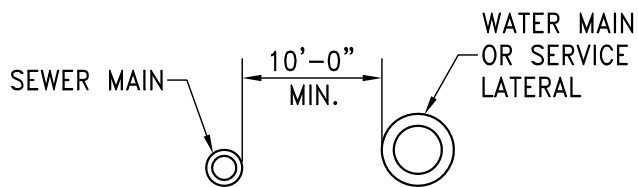
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

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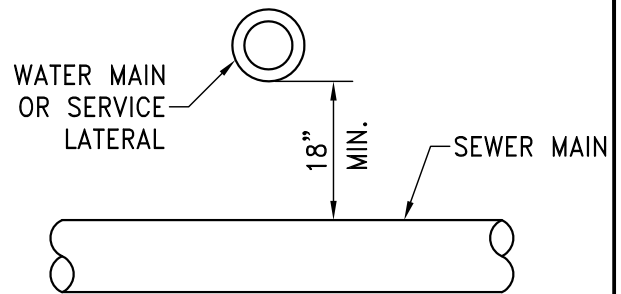
**YARD DRAIN**

**R-203**

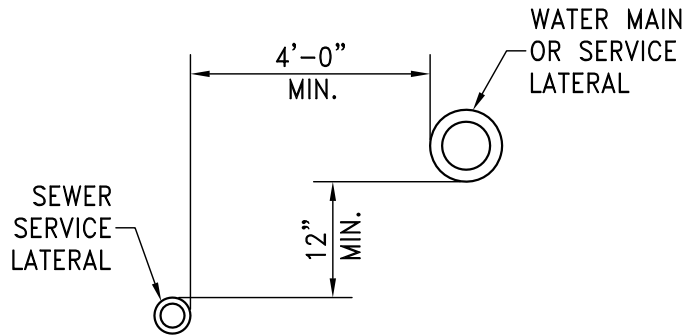
APPROVED BY: JF | DATE: 1/2013



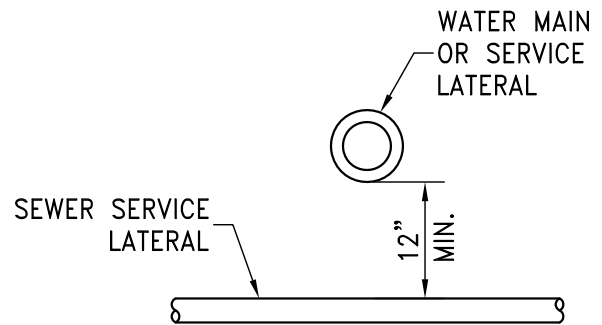
SEWER MAIN INSTALLATION PARALLEL TO WATER MAIN OR WATER SERVICE LATERAL (TYP.)



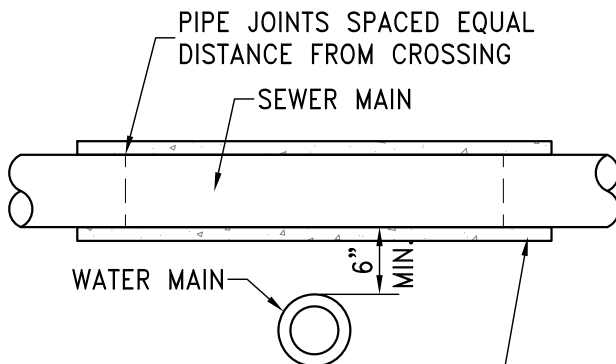
SEWER MAIN CROSSING WATER MAIN OR WATER SERVICE LATERAL (TYP.)



SEWER SERVICE LATERAL INSTALLATION PARALLEL TO WATER MAIN OR WATER SERVICE LATERAL (TYP.)

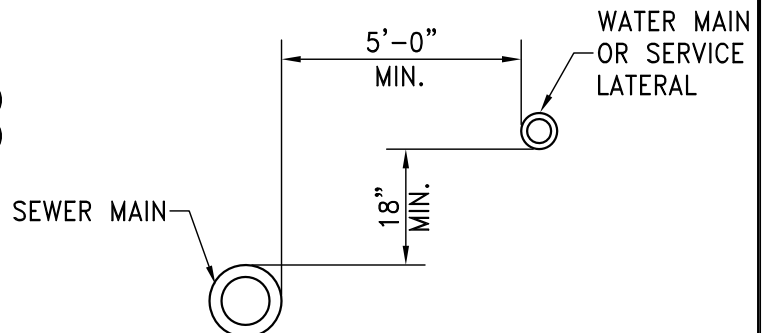


SEWER SERVICE LATERAL CROSSING WATER MAIN OR WATER SERVICE LATERAL (TYP.)



DUCTILE IRON SLEEVE OR CONCRETE ENCASEMENT (SHOWN).  
10' MIN. ON EACH SIDE OF CROSSING

SEWER MAIN CROSSING WATER MAIN (ALT.)



SEWER MAIN INSTALLATION PARALLEL TO WATER MAIN OR WATER SERVICE LATERAL (ALT.)

**NOTES:**

1. INSTALLATION OF SEWER LINES AND LATERALS SHALL BE IN CONFORMANCE WITH ALL STATE OF NEVADA WATER/SEWER SYSTEM SEPARATION REGULATIONS.
2. WHENEVER POSSIBLE, SEWER LINES AND LATERALS SHALL BE INSTALLED IN SEPARATE TRENCHES IN THE TYPICAL CONFIGURATIONS SHOWN ABOVE.
3. IF THE PIPE CANNOT BE INSTALLED IN THE TYPICAL OR ALTERNATIVE CONFIGURATIONS, THE CONTRACTOR SHALL HAVE WRITTEN APPROVAL FROM THE DIVISION OF HEALTH FOR ANY OTHER INSTALLATION CONFIGURATION.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

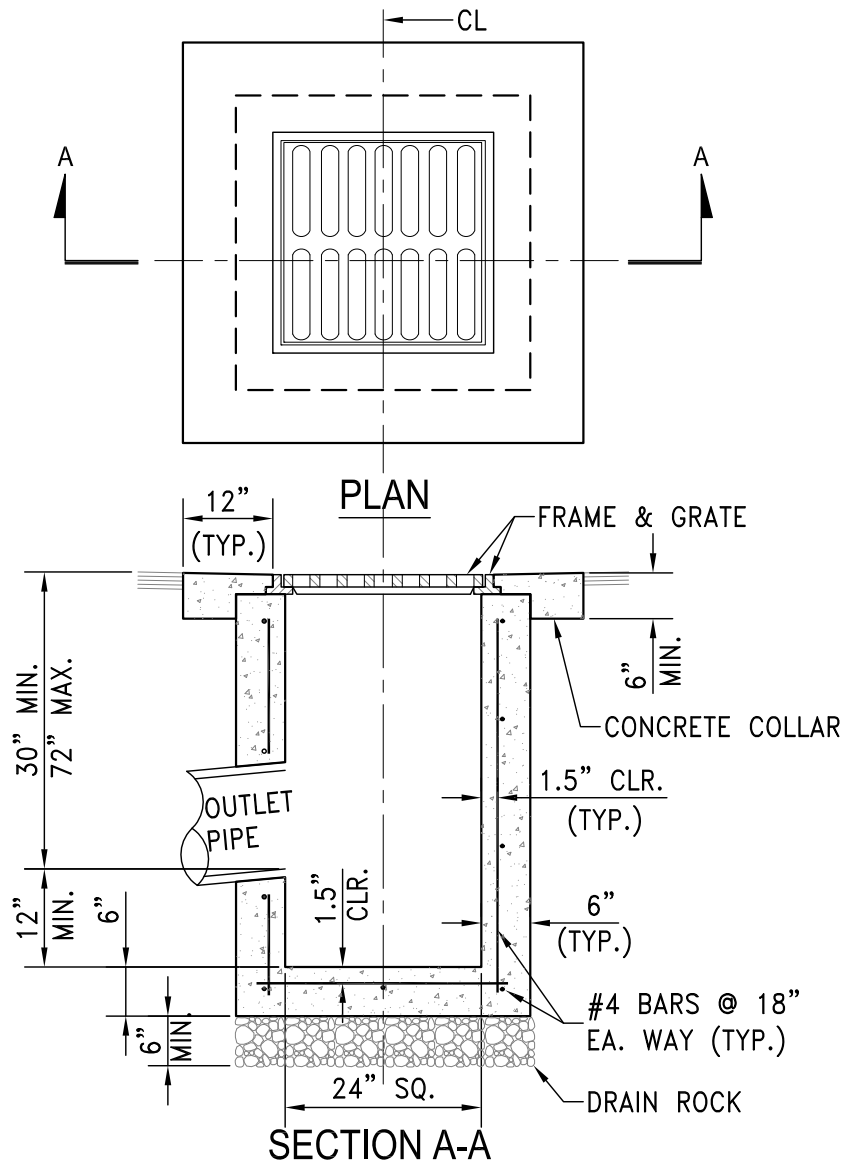
# WATER / SEWER SEPARATION

DRAWING No.

R-204

APPROVED BY: JF

DATE: 8/2014



**NOTES:**

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. REINFORCING STEEL SHALL BE GRADE 40 AND HAVE 1.5" CLEAR COVER.
3. CONCRETE STRUCTURE MAY BE A PRE-CAST CONCRETE UNIT. BASE OF PRE-CAST CONCRETE UNIT SHALL BE PLACED ON 6" COMPACTED DRAIN ROCK.
4. FRAME & GRATE SHALL BE D&L I-9226 OR APPROVED EQUAL.
5. CATCH BASIN SHALL BE TRAFFIC-RATED AND USED ONLY AT LOW POINTS IN ALLEYS OR PARKING AREAS.
6. ALL CATCH BASINS, PUBLIC OR PRIVATE, SHALL BE PROVIDED WITH A "SUR-TRAP" OIL/WATER SEPARATOR OR APPROVED EQUAL.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

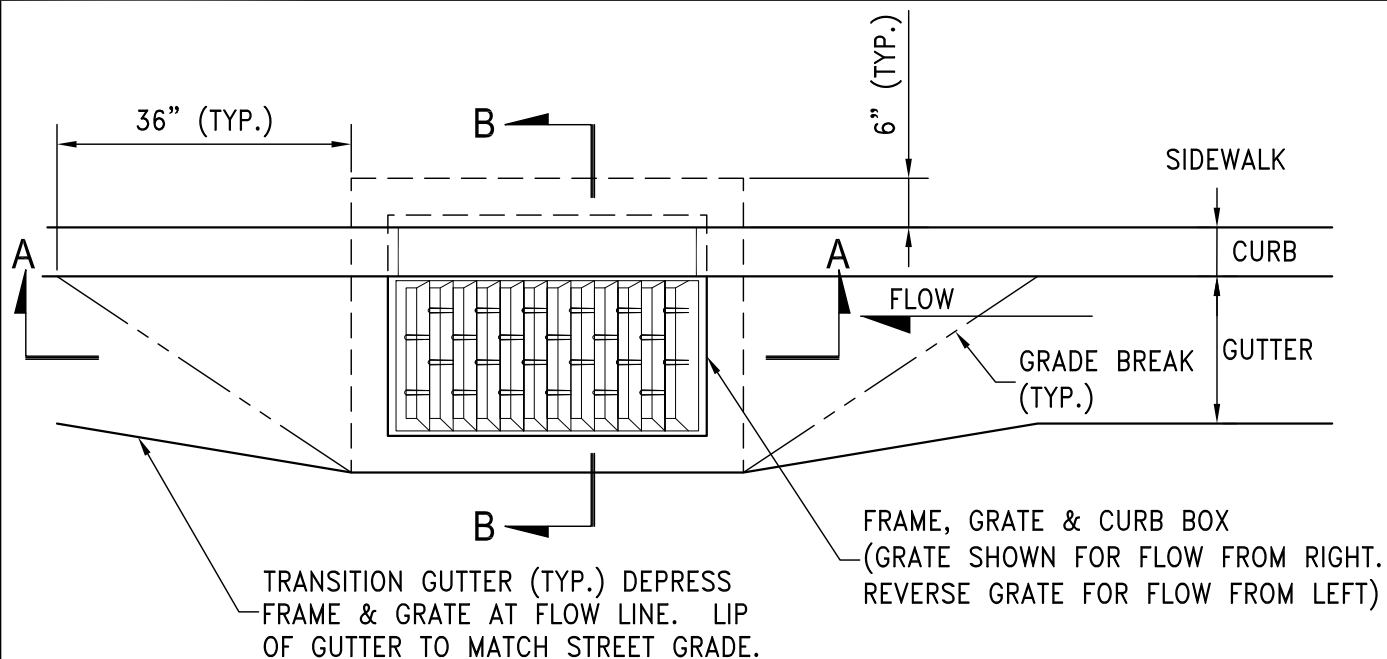
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# CATCH BASIN TYPE 3-R

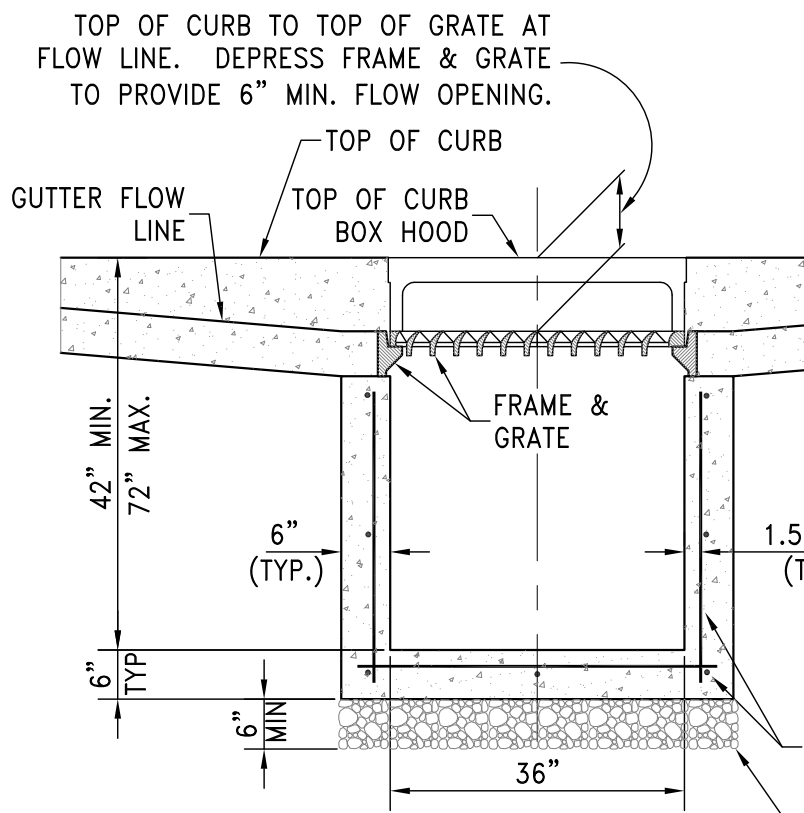
R-205

APPROVED BY: JF DATE: 1/2013

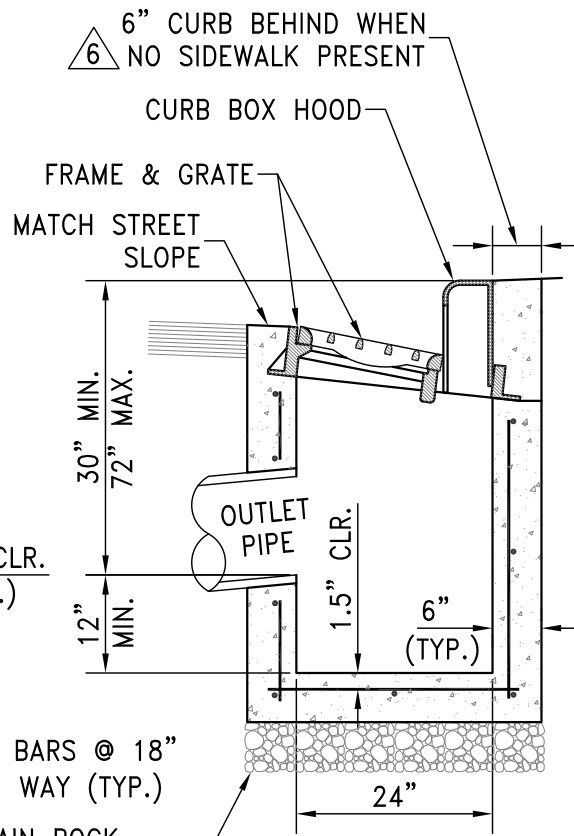




PLAN



SECTION A-A



SECTION B-B



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# CATCH BASIN TYPE 4-R

DRAWING No.

R-206A

APPROVED BY: JF DATE: 1/2013

NOTES:

1. P.C.C CURB AND GUTTER TRANSITION SHALL BE FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) AND SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. REINFORCING STEEL SHALL BE GRADE 40 AND HAVE 1.5" MINIMUM CLEAR COVER.
3. CONCRETE STRUCTURE MAY BE A PRE-CAST CONCRETE UNIT UPON APPROVAL OF THE CITY ENGINEER. BASE OF PRE-CAST CONCRETE UNIT SHALL BE PLACED ON 6" COMPACTED DRAIN ROCK.
4. FRAME, GRATE AND CURB BOX HOOD ASSEMBLY SHALL BE D&L I-3519 WITH TYPE L "VANE GRATE" OR APPROVED EQUAL. GRATE SHALL BE INSTALLED WITH PROPER FLOW DIRECTION. EACH CATCH BASIN SHALL BE CAST WITH A FISH IMAGE AND THE WORDS "NO DUMPING! DRAINS TO WATERWAYS" IN THE TOP OF EACH CURB HOOD.
5. TILT FRAME & GRATE AS REQUIRED TO ATTAIN 6" MIN. FLOW OPENING & INSTALL DURABLE SHIMS BETWEEN THE CURB BOX & FRAME AS REQUIRED TO MATCH CURB BOX TO TOP OF CURB AND FACE OF CURB (SEE SECTION B-B).
6. WHEN SIDEWALK IS PRESENT CONCRETE BEHIND CURB BOX SHALL BE THICKENED TO THE FULL DEPTH OF THE CURB BOX. IF NO SIDEWALK IS PRESENT, POUR 6" CONCRETE CURB STRUCTURE BEHIND GRATE AND TIE BEAM INTO BOX.
7. ALL CATCH BASINS, PUBLIC OR PRIVATE, SHALL BE PROVIDED WITH A "SUR-TRAP" OIL/WATER SEPARATOR OR APPROVED EQUAL.
8. FRAMES AND GRATES SHALL BE MATCHED TO ACHIEVE A CLOSE TOLERANCE FIT WITH MINIMAL GAPS.
9. CATCH BASIN SHALL NOT BE PLACED WITHIN THE RADIUS OF THE CURB.



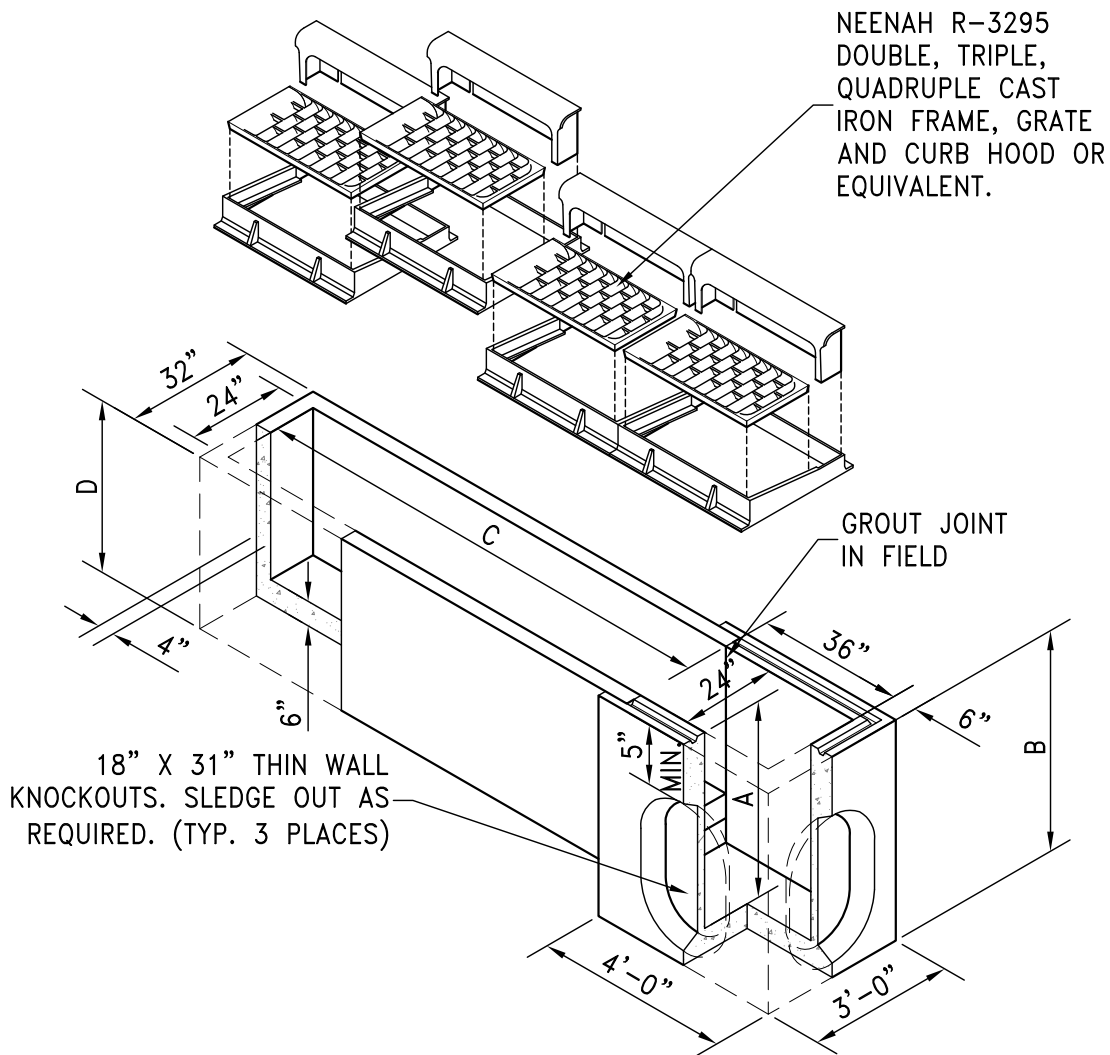
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**NOTES**  
**CATCH BASIN TYPE 4-R**

**R-206B**

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. A HIGH CAPACITY CURB INLET SHALL BE USED WHEN DESIGN FLOW RATES EXCEED THE CAPACITY OF A SINGLE CATCH BASIN.
2. FOR DIMENSIONS, NOTES, AND DETAILS NOT SHOWN, REFER TO THE APPLICABLE CATCH BASIN DETAIL DRAWINGS.



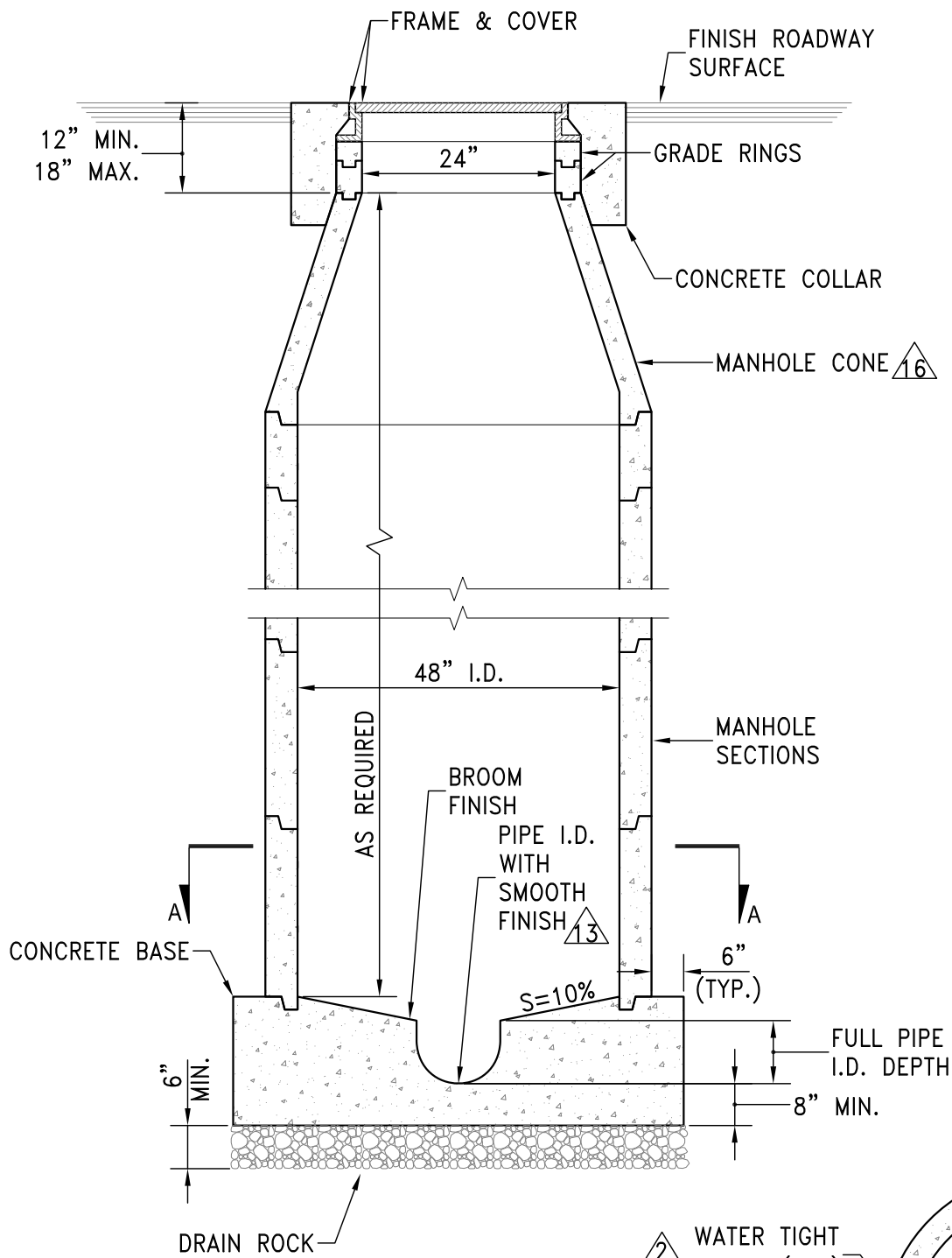
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

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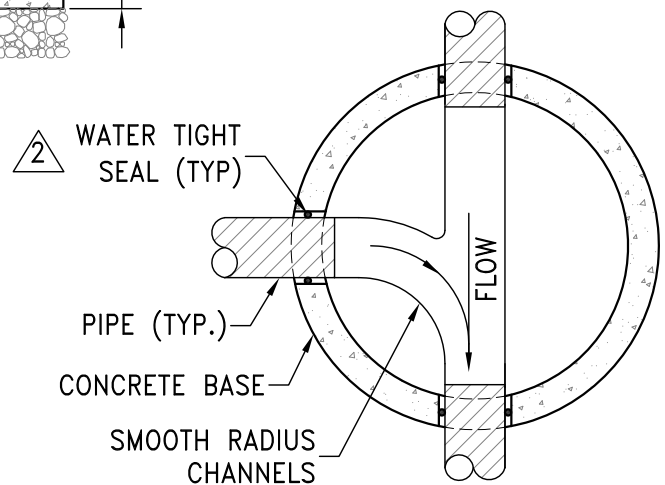
# HIGH CAPACITY CURB INLET

R-207

APPROVED BY: JF DATE: 1/2013



**SECTION**



**SECTION A-A**



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**MANHOLE TYPE I**

**R-208A**

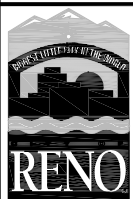
APPROVED BY: JF

DATE: 1/2013



## GENERAL MANHOLE NOTES

1. ALL PRECAST MANHOLE COMPONENTS SHALL CONFORM TO ASTM C-478.
2. PIPES SHALL NOT PROTRUDE MORE THAN 3" INSIDE MANHOLE SECTION AS MEASURED AT THE OUTSIDE EDGES OF THE PIPE, VERTICALLY ALIGNED WITH THE SPRINGLINE. PIPE CONNECTION TO MANHOLE SHALL BE WATERTIGHT PER STANDARD DETAILS R-223A, R-223B AND R-223C.
3. MANHOLE BASE SHALL BE PORTLAND CEMENT CONCRETE (P.C.C.) AND SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD WITH SLUMP AT 1 TO 4 INCHES. ALL MATERIAL SHALL CONFORM TO STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). PRECAST CONCRETE BASE MAY BE USED IN LIEU OF CAST-IN-PLACE BASE.
4. TYPE I MANHOLE TO BE UTILIZED FOR PIPE DIAMETERS OF 12" OR SMALLER AND DEPTHS NOT EXCEEDING 18 FEET.
5. TYPE V MANHOLE TO BE UTILIZED FOR PIPE DIAMETERS OF 15" THROUGH 27" OR DEPTHS EXCEEDING 18 FEET.
6. MANHOLE MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF SECTION 204 "MANHOLES AND CATCH BASINS" OF THE STANDARD SPECIFICATIONS.
7. PRECAST MANHOLE SECTIONS, OTHER THAN GRADE RINGS, SHALL BE JOINED WITH FLEXIBLE GASKET MATERIAL SUCH AS "RAM-NEK" OR EQUAL AS PER MANUFACTURER'S RECOMMENDATIONS.
8. EXCAVATION AND BACKFILL SHALL BE AS SPECIFIED FOR "TRENCH EXCAVATION AND BACKFILL" IN SECTION 305 OF THE STANDARD SPECIFICATIONS.
9. EXCAVATION SHALL BE AS NEARLY VERTICAL AS POSSIBLE (SHEET AND SHORE IF SOIL CONDITIONS REQUIRE) IN EXISTING STREET SECTIONS, ALLEY SECTIONS, AND CONFINED AREAS, SUCH AS LIMITED EASEMENTS OR ADJACENT STRUCTURES.
10. MANHOLE PRECAST SECTION LENGTH SHALL BE ARRANGED TO FIT THE REQUIRED DEPTH.
11. NO LATERALS OR PIPES LESS THAN 8" IN DIAMETER SHALL BE CONNECTED TO THE MANHOLE.
12. PRECAST CONCRETE BASE MAY BE USED IN LIEU OF CAST-IN-PLACE BASE.
13. MATCH PIPE INVERTS TO MANHOLE INVERTS WHERE PIPES CONNECT TO MANHOLE BASE.
14. ALL MANHOLES SHALL BE WATERTIGHT.
15. SEE DETAIL FOR OUTSIDE DROP MANHOLE FOR SANITARY SEWERS WITH MORE THAN 2 FEET VERTICAL DROP AT THE MANHOLE. THE USE OF "INSIDE DROP" MANHOLES IS NOT PERMITTED.
16. THE USE OF FLAT TOP MANHOLE CONES REQUIRES PRIOR APPROVAL FROM THE CITY ENGINEER.
17. PRIOR TO BACKFILLING, ALL MANHOLES SHALL BE VACUUM TESTED PER ASTM C-1244.
18. NO STEPS, LADDERS, OR OTHER CLIMBING DEVICES SHALL BE INSTALLED IN THE MANHOLE.
19. REINFORCING STEEL SHALL BE AS SHOWN, WIRED TIGHTLY AT ALL INTERSECTIONS AND EMBEDDED AT LEAST 1½" CLEAR, UNLESS OTHERWISE NOTED.
20. WHEN PIPE CONNECTIONS TO EXISTING MANHOLES ARE ALLOWED, THEY SHALL BE MADE BY CORE DRILLING THE MANHOLE AND CONNECTING THE PIPE PENETRATION PER DETAIL R-223A & R-223B.



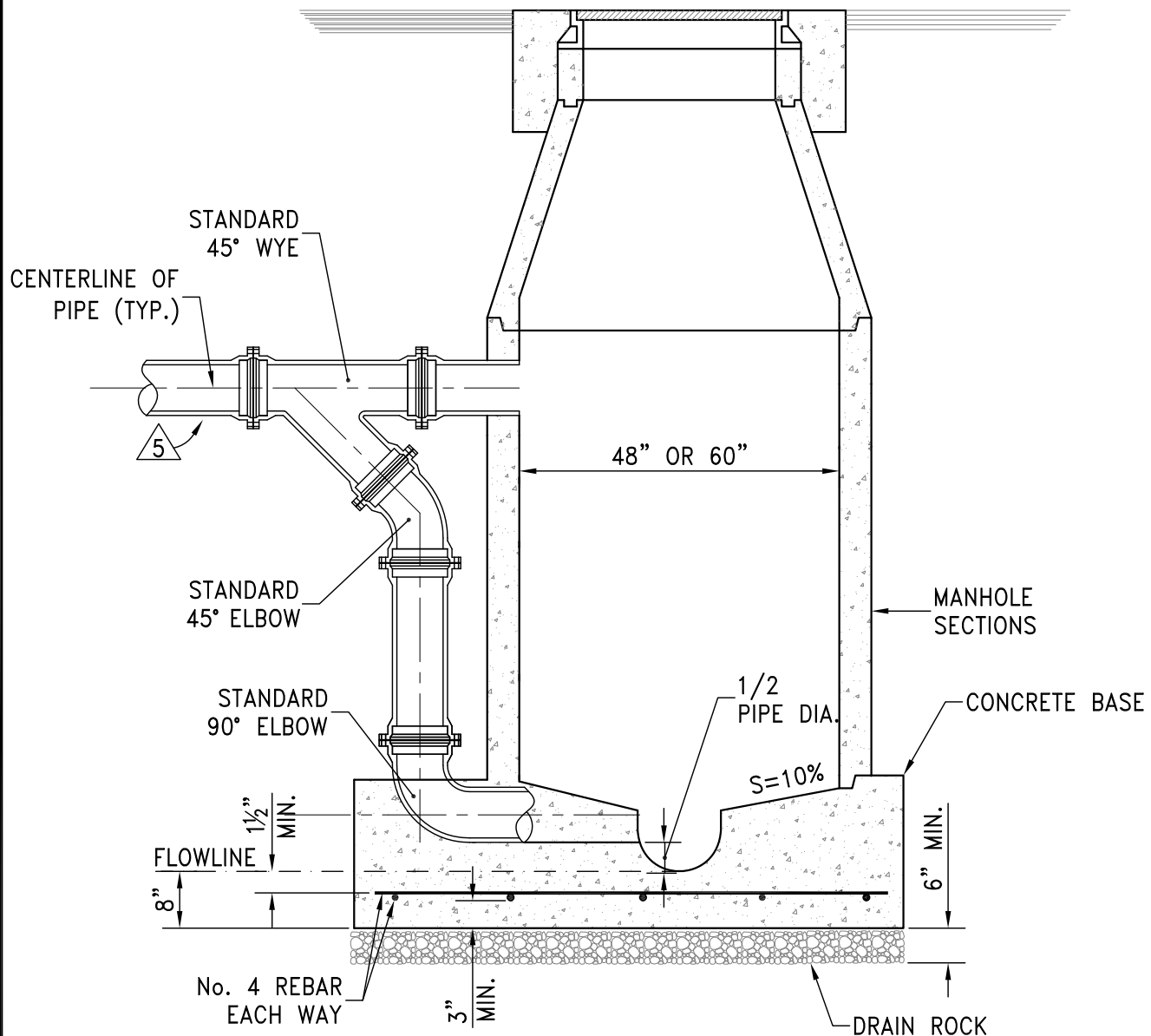
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# NOTES - MANHOLE TYPE I & TYPE V

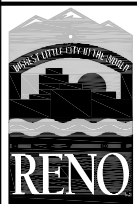
DRAWING No.

R-208C

APPROVED BY: JF      DATE: 4/2014



1. DETAIL FOR OUTSIDE DROP ASSEMBLY ONLY. FOR DIMENSIONS, NOTES AND DETAILS NOT SHOWN, REFER TO THE APPLICABLE STANDARD DETAIL DRAWING.
2. CONSTRUCTION OF AN OUTSIDE DROP MANHOLE MUST BE APPROVED IN WRITING BY THE CITY ENGINEER IN ADVANCE OF ANY CONSTRUCTION.
3. OUTSIDE DROP MANHOLES ARE TO BE USED ON SANITARY SEWERS WITH MORE THAN 2 FEET VERTICAL DROP AT THE MANHOLE, NOT TO EXCEED 8 FEET, UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. SANITARY SEWER PIPE COMPONENTS OF THE OUTSIDE DROP CONFIGURATION SHALL BE DUCTILE IRON PIPE WITH MECHANICAL JOINT FITTINGS PER AWWA A21.51-02.
5. INSTALL ONE FULL LENGTH OF DUCTILE IRON PIPE (MIN. LENGTH 20') BEYOND THE UPSTREAM END OF THE STANDARD 45° WYE.
6. DUCTILE IRON MATERIAL TO BE LINED AND COATED PER AWWA A21.51-02.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

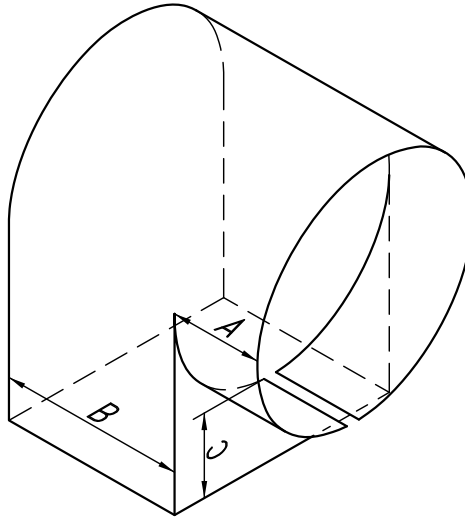
## MANHOLE-OUTSIDE DROP

DRAWING No.

R-209

APPROVED BY: JF

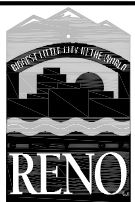
DATE: 1/2013



DIMENSIONS			
SIZE	A	B	C
4"	3"	3"	3"
6"	4"	5"	4"
8"	4"	6.5"	4"
10"	4"	8"	4"
12"	5"	10"	4"
15"	6"	10.5"	6.5"

**NOTES:**

1. ALL CATCH BASINS, PUBLIC OR PRIVATE, SHALL BE PROVIDED WITH A "SUR-TRAP" OIL/WATER SEPARATOR OR APPROVED EQUAL.
2. INSTALL OIL/WATER SEPARATOR WITH THE BOTTOM EDGE PARALLEL TO THE WATER SURFACE AND THE RECTANGULAR OPENING FACING DOWNWARD AND THE CIRCULAR END PLACED INSIDE THE OUTLET PIPE.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

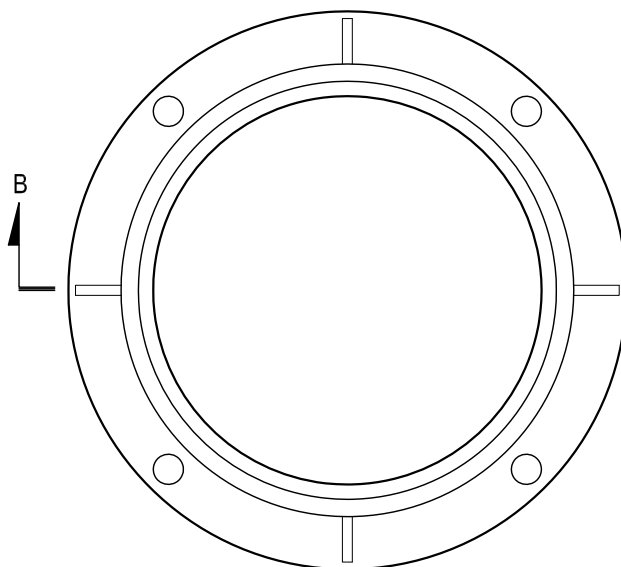
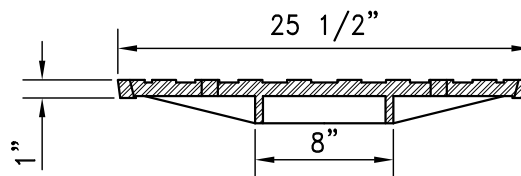
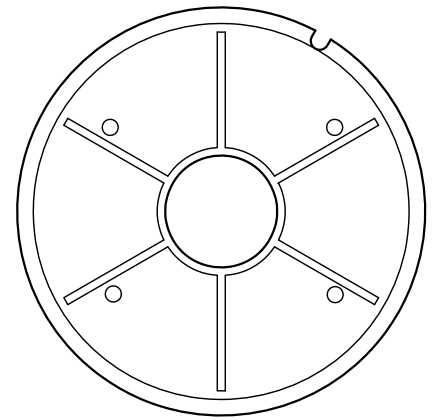
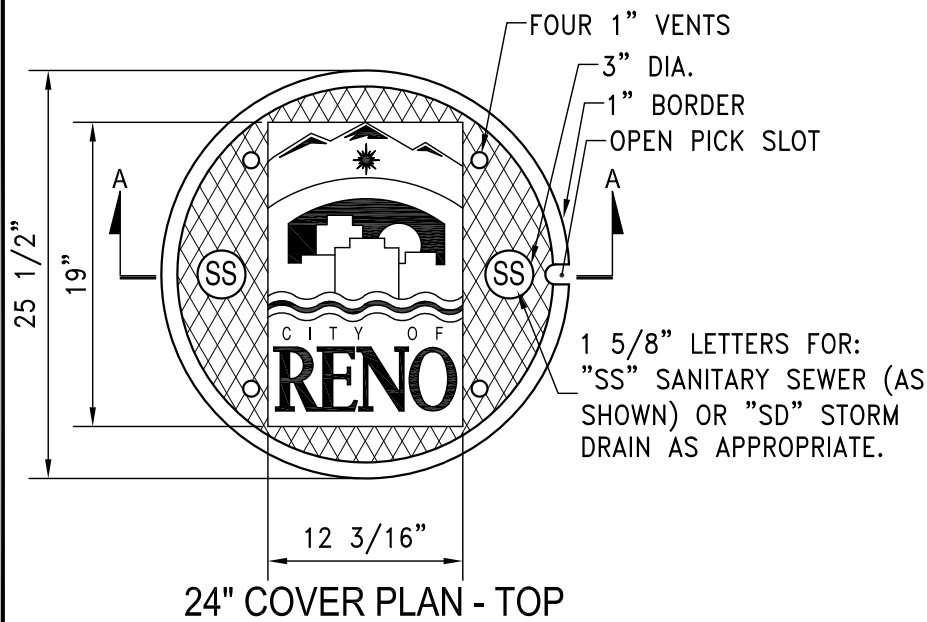
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# CATCH BASIN OIL /WATER SEPARATOR

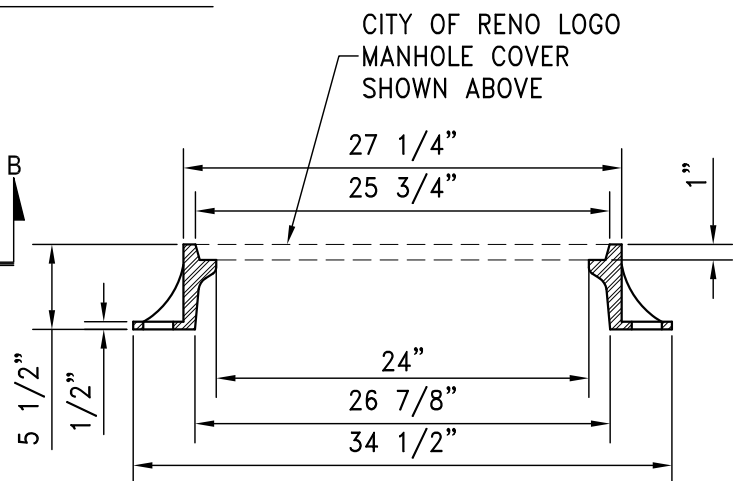
R-213

APPROVED BY: JF | DATE: 1/2013





SECTION A-A



24" MANHOLE FRAME

SECTION B-B

24" FRAME AND COVER NOTES:

1. CITY OF RENO LOGO FRAME AND COVERS SHALL BE D&L FOUNDRY A1032 CITY OF RENO FRAME AND COVER OR APPROVED EQUAL. RENO LOGO FRAMES AND COVERS ARE TO BE PLACED ONLY ON CITY OF RENO MAINTAINED FACILITIES. PRIVATE FACILITIES SHALL NOT HAVE THE RENO LOGO ON THE LIDS. THEY SHALL ONLY HAVE THE LETTERS INDICATING "SS" OR "SD".
2. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACE.
3. CASTINGS SHALL BE CAST GRAY IRON AND MEET THE REQUIREMENTS OF ASTM A-48, CLASS 35B, NO PAINT.



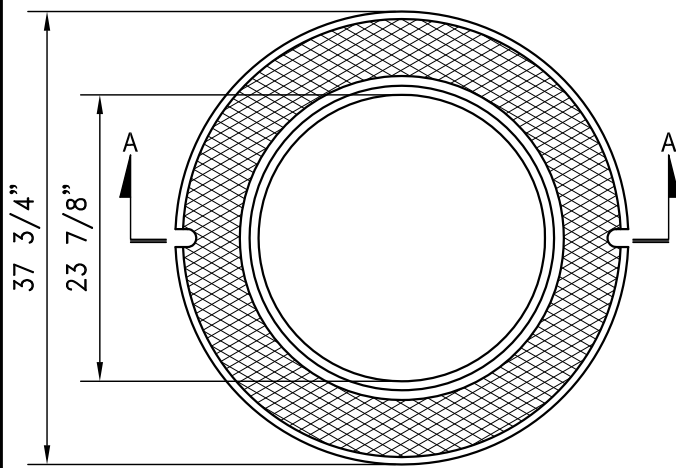
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# 24" MANHOLE FRAME & COVER

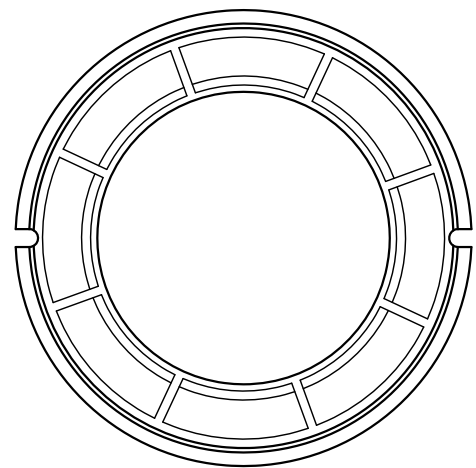
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R-214A

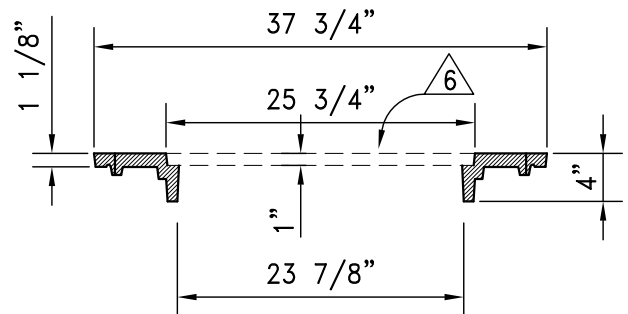
APPROVED BY: JF DATE: 4/2015



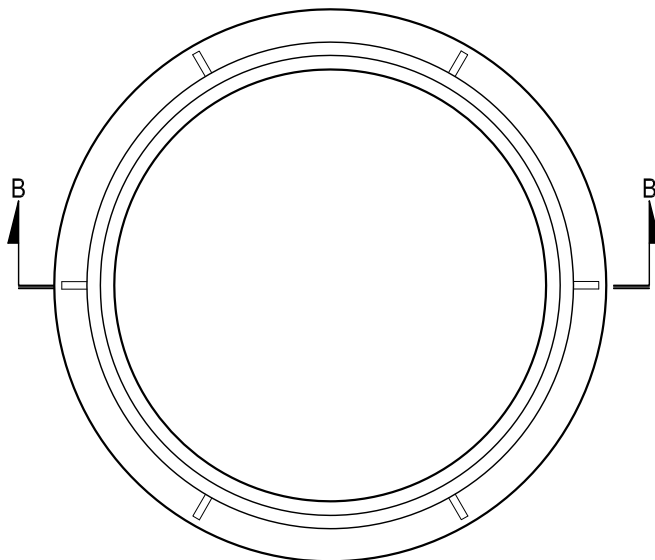
**24" COVER ADAPTOR PLAN - TOP**



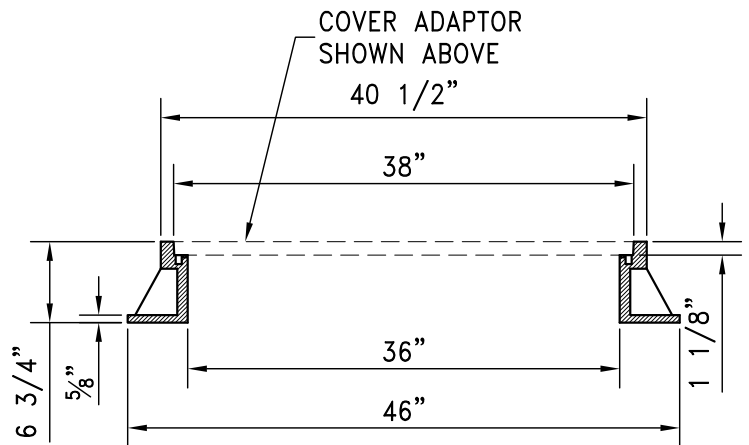
**24" COVER ADAPTOR PLAN - BOTTOM**



**SECTION A-A**



**36" MANHOLE FRAME**



**SECTION B-B**

**36" FRAME AND COVER ADAPTOR NOTES:**

1. 24" COVER ADAPTOR SHALL BE D&L FOUNDRY A1462-R5, TO ACCEPT D&L FOUNDRY A1032 CITY OF RENO MANHOLE COVERS AND TO SET IN D&L FOUNDRY A1462 CITY OF RENO FRAME OR APPROVED EQUAL.
2. 36" MANHOLE FRAME SHALL BE D&L FOUNDRY A1462 CITY OF RENO FRAME OR APPROVED EQUAL.
3. CASTINGS SHALL BE CAST GRAY IRON, AND MEET THE REQUIREMENTS OF ASTM A-48, CLASS 35B, NO PAINT.
4. FURNISHED WITH MACHINED HORIZONTAL BEARING SURFACE.
5. MANHOLE COVER ADAPTOR SHALL BE FREE OF HOOKS OR PROTRUSIONS THAT MAY HINDER REMOVAL.
6. FOR A1032 CITY OF RENO LOGO COVER, SEE 24" MANHOLE FRAME AND COVER DETAIL (COVER ONLY).



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

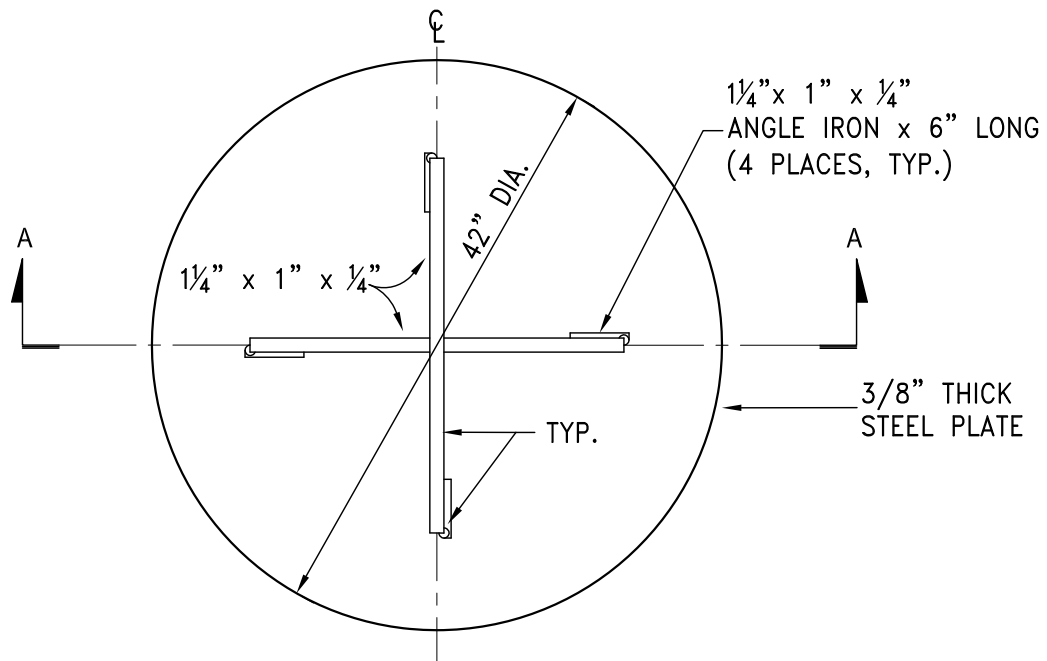
**36" MANHOLE FRAME  
WITH 24" COVER ADAPTOR**

DRAWING No.

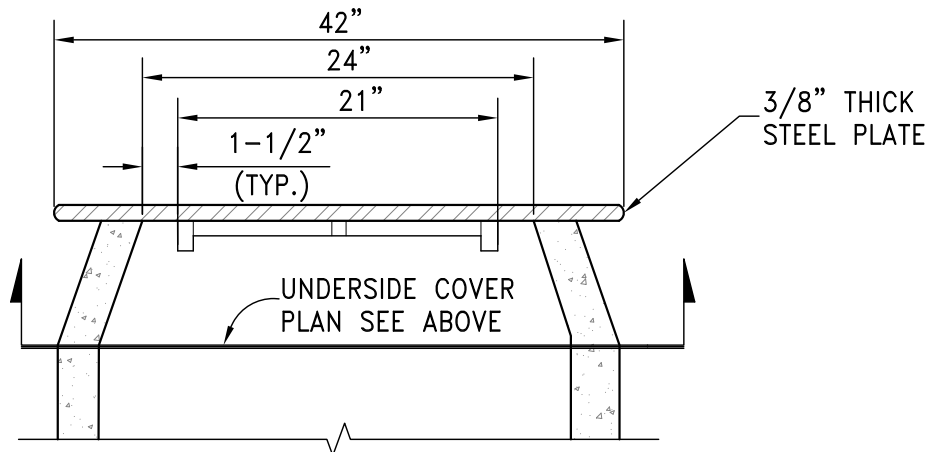
**R-214B**

APPROVED BY: JF

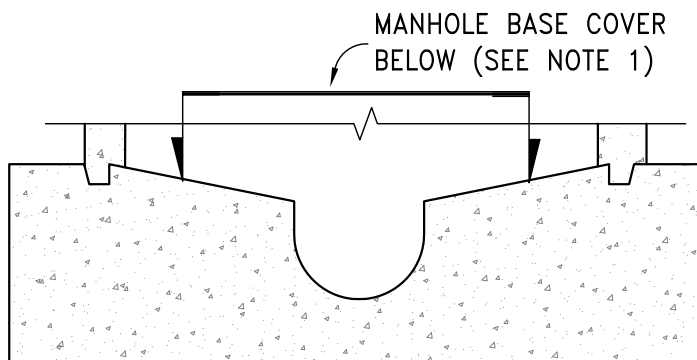
DATE: 3/2014



**TEMPORARY COVER**



**SECTION A-A**



**NOTES:**

1. INSTALL TEMPORARY COVER WITH CONE INSTALLATION WHEN INSTALLING NEW MANHOLE OR PRIOR TO REMOVING EXISTING FRAME & COVER AND GRADE RINGS TO ADJUST TO FINISH GRADE. INSTALL COVER OVER MANHOLE BASE TO PREVENT DEBRIS FROM ENTERING SEWER SYSTEM. THE MANHOLE BASE COVER SHALL BE IN PLACE PRIOR TO PERFORMING ANY ADJUSTMENTS OR GROUTING AND SHALL REMAIN IN PLACE WHILE ADJUSTMENTS OR GROUTING ARE BEING PERFORMED. REMOVE BASE COVER UPON ADJUSTMENT APPROVAL BY CITY OF RENO.



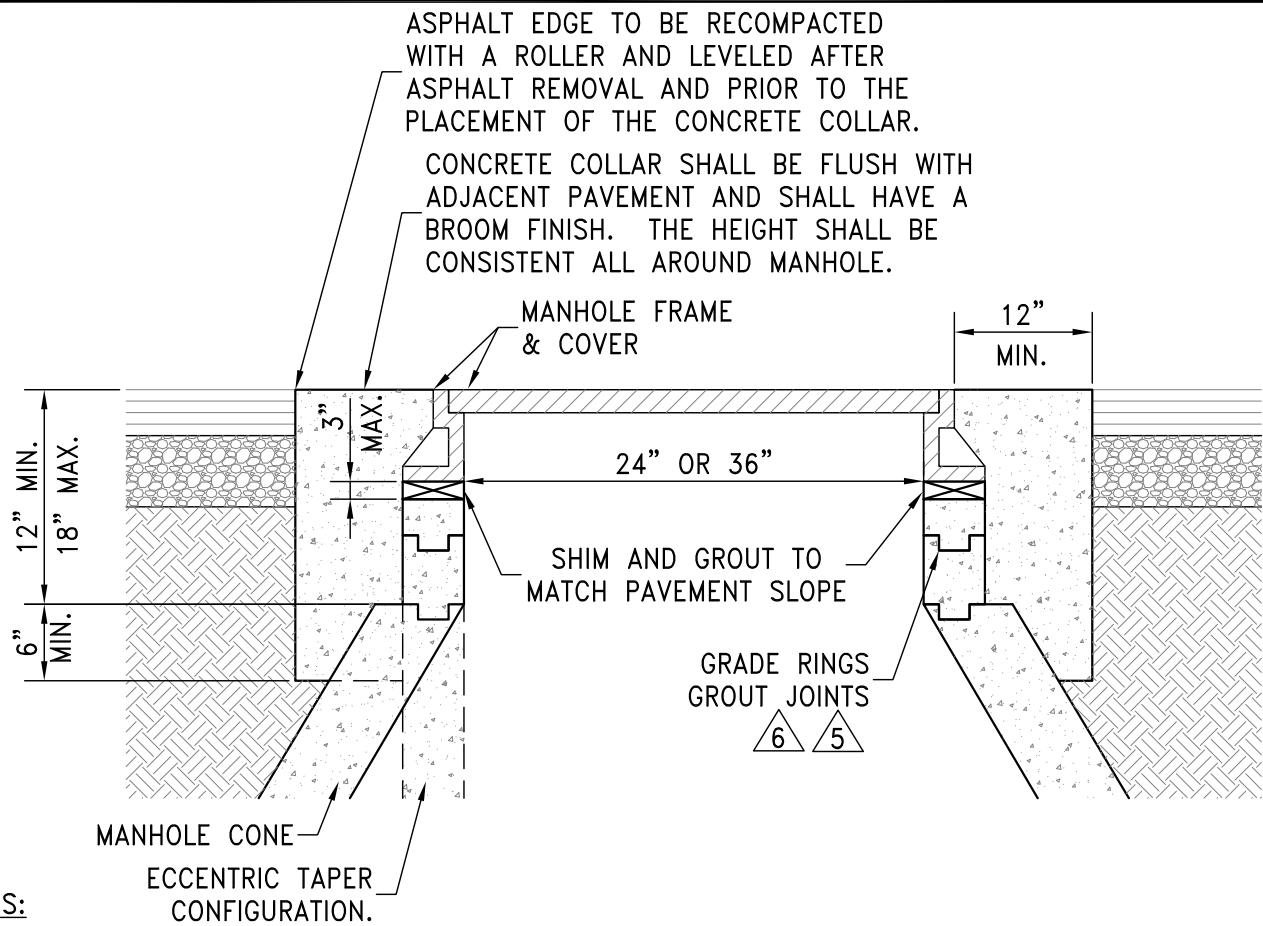
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**TEMPORARY MANHOLE  
COVER**

DRAWING No.

**R-214C**

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. CIRCUMSTANCES MAY REQUIRE THE NEED FOR SPECIAL TYPES OF TOP OF MANHOLE CONFIGURATIONS SUCH AS FLAT TOP, ABOVE GROUND, ETC. AS DIRECTED BY THE CITY OF RENO. DETAILED PLANS OF ANY SPECIAL TOP OF MANHOLE CONFIGURATIONS AND ASSOCIATED COLLARS MUST BE APPROVED BY THE ENGINEER.
3. IN UNPAVED AREAS, IT SHALL BE NECESSARY TO SET THE MANHOLE RIM APPROXIMATELY 6 INCHES ABOVE THE SURROUNDING AREA. INSTALL A 6 INCH THICK RING OF CONCRETE, TAPERED AT A 3:1 SLOPE, FROM THE TOP, OUTSIDE EDGE OF THE COLLAR TO THE EXISTING GROUND SURFACE.
4. EXISTING SANITARY SEWER MANHOLE LIDS LOCATED IN GUTTER PANS, SHALL HAVE NEW WATER TIGHT FRAMES AND COVERS.
5. ALL GRADE RING JOINTS ARE TO BE GROUTED WITH NON-SHRINK GROUT HAVING THE FOLLOWING CHARACTERISTICS: 3000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD AND SLUMP AT 1 TO 4 INCHES. ALL MATERIAL SHALL CONFORM TO SSPWC.
6. ALL GRADE RINGS SHALL BE PORTLAND CEMENT CONCRETE. PVC GRADE RINGS ARE NOT ALLOWED.



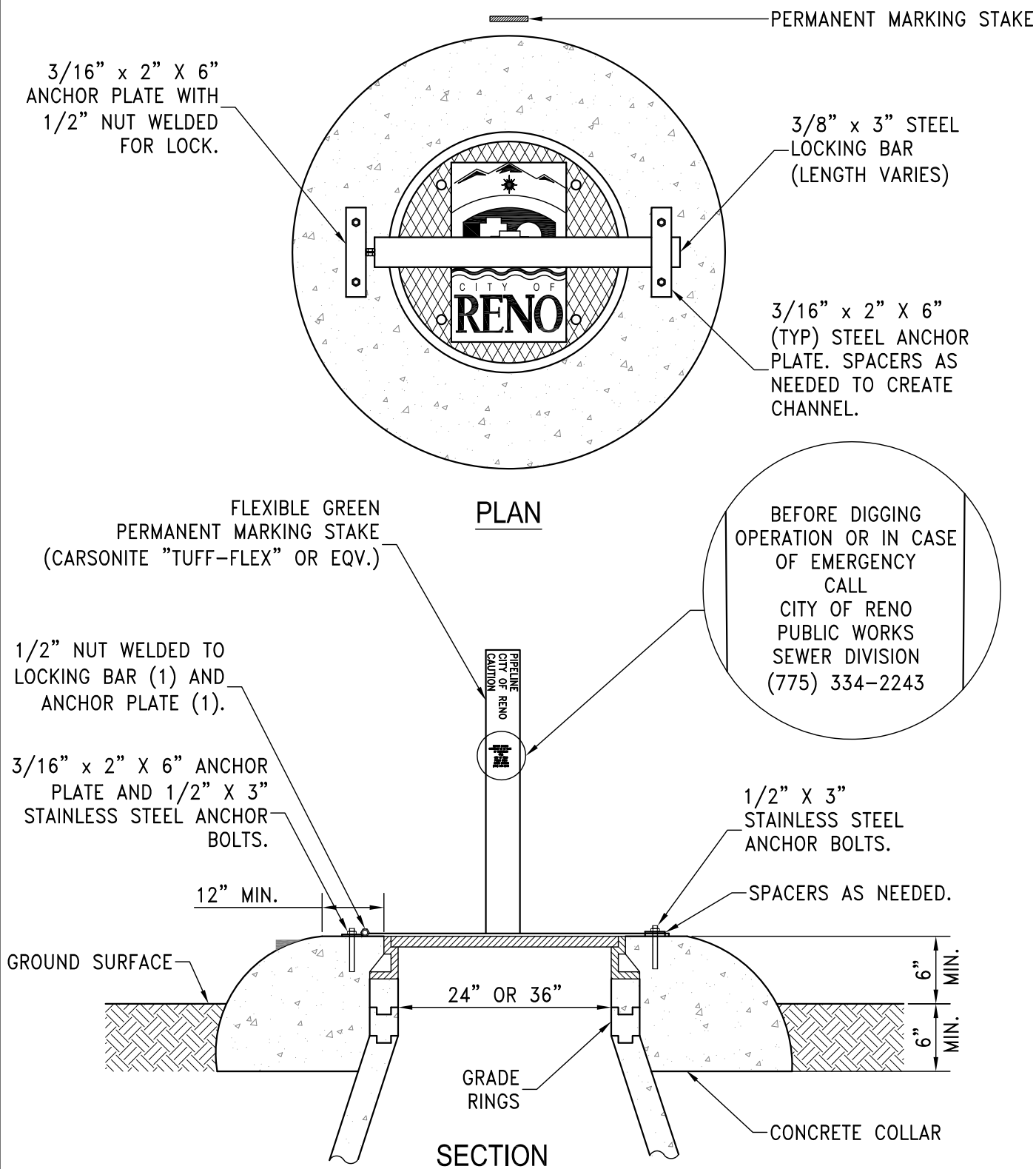
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# MANHOLE COLLAR

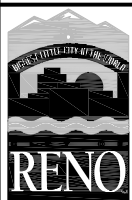
R-218A

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. LOCK TO BE SUPPLIED BY CITY OF RENO-SEWER LINES MAINTENANCE.
2. ALL NOTES FROM "MANHOLE COLLAR" DETAIL R-218A SHALL APPLY.



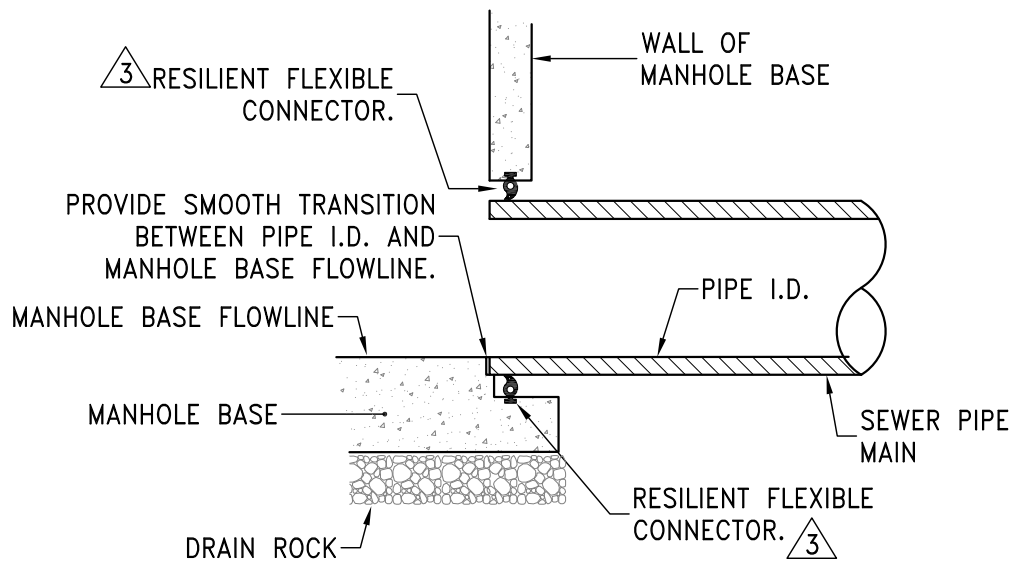
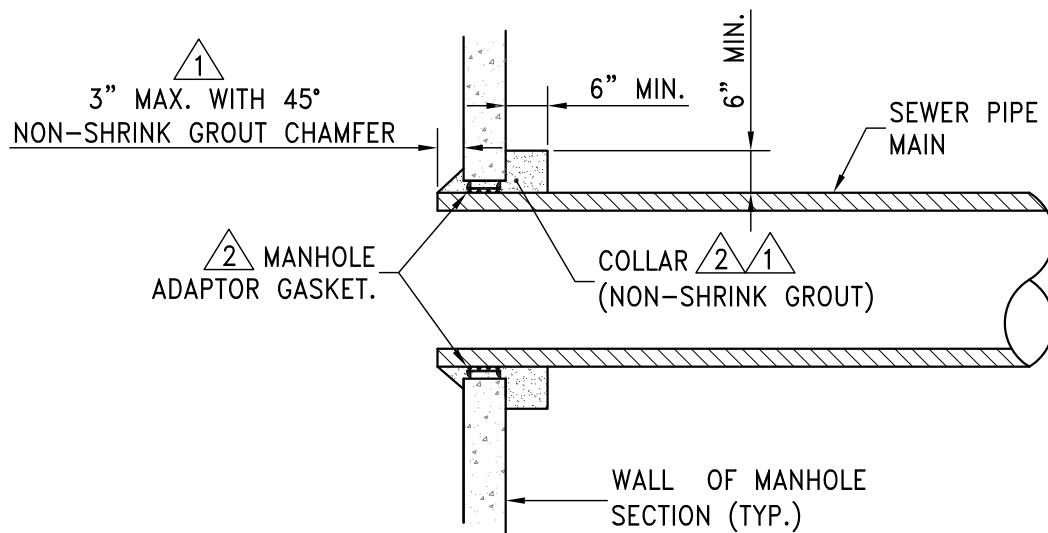
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# MANHOLE COLLAR EASEMENT AREAS

DRAWING No.

R-218B

APPROVED BY: JF DATE: 1/2013



**NOTES:**

**SECTION**

1. NON-SHRINK GROUT SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD AND SLUMP AT 1 TO 4 INCHES. ALL MATERIAL SHALL CONFORM TO STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC) SECTION 202.
2. SANITARY SEWER PIPE CONNECTION TO MANHOLE SECTIONS (DROP MANHOLES) REQUIRE AN AGENCY-APPROVED FORM OF SEAL OR WATER STOP TO PROVIDE A WATERTIGHT CONNECTION. UTILIZE A ROMAC STYLE "LCT" MANHOLE ADAPTOR GASKET OR APPROVED EQUAL IN CONJUNCTION WITH NON-SHRINK GROUT.
3. SANITARY SEWER PIPE CONNECTION TO MANHOLE BASE SHALL REQUIRE A RESILIENT FLEXIBLE CONNECTOR INSTALLED IN ACCORDANCE WITH STANDARD DETAIL R-223C.
4. ALL PIPE OPENINGS TO NEW MANHOLES MUST BE EITHER CAST-IN-PLACE OR PRE-FORMED AND PIPE OPENINGS TO EXISTING MANHOLES MUST BE CORE DRILLED.



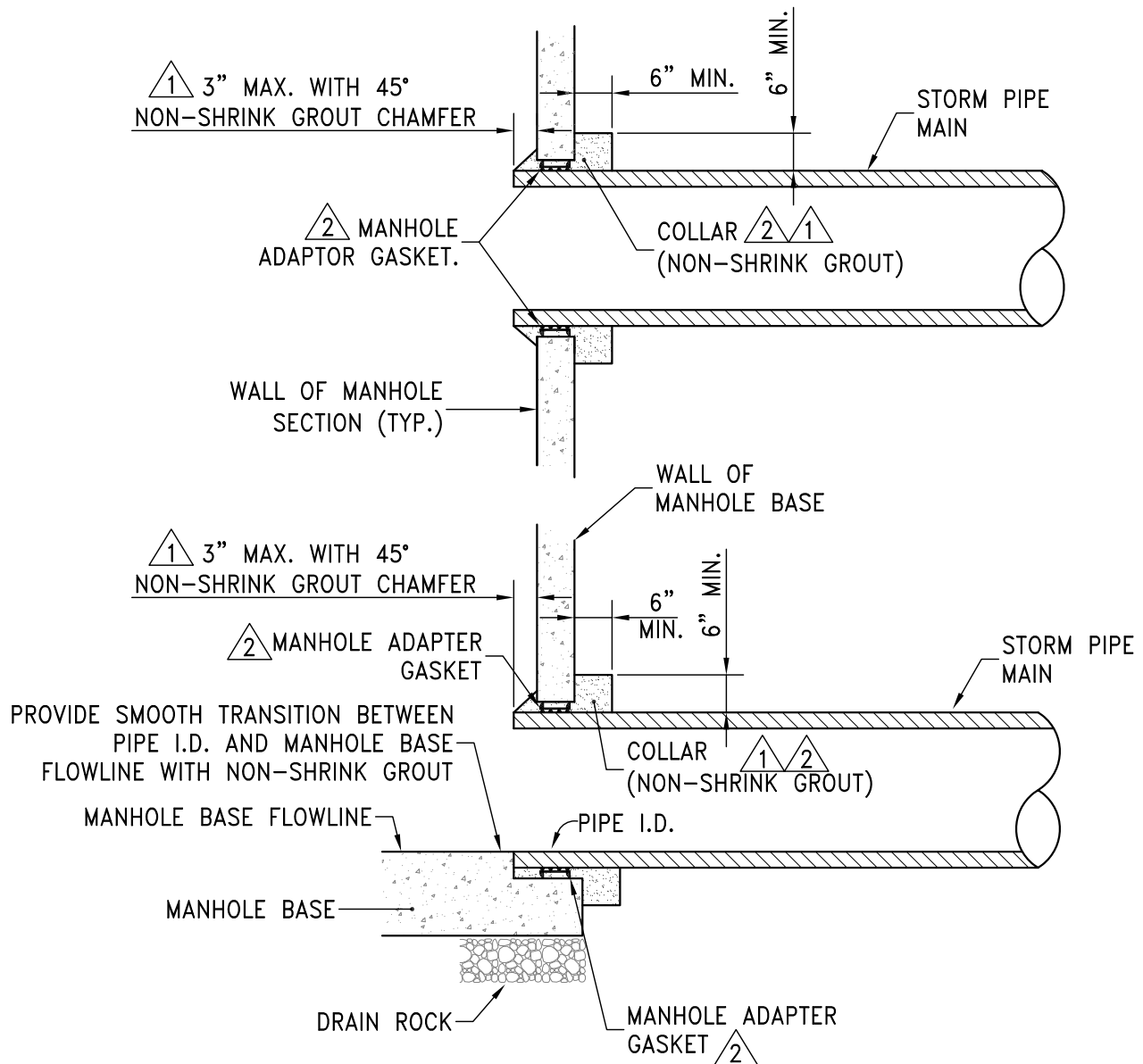
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**SANITARY SEWER PIPE  
TO MANHOLE CONNECTION**

DRAWING No.

**R-223A**

APPROVED BY: JF DATE: 4/2014



**NOTE:**

1. NON-SHRINK GROUT SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD AND SLUMP AT 1 TO 4 INCHES. ALL MATERIAL SHALL CONFORM TO SSPWC SECTION 202.
2. STORM DRAIN PIPE CONNECTIONS TO MANHOLE BASES AND SECTIONS REQUIRE AN AGENCY-APPROVED FORM OF SEAL OR WATER STOP AND IS REQUIRED ON ALL STORM DRAIN INSTALLATIONS TO PROVIDE A WATERTIGHT CONNECTION. UTILIZE A ROMAC STYLE "LCT" MANHOLE ADAPTER GASKET OR APPROVED EQUAL IN CONJUNCTION WITH THE NON-SHRINK GROUT.
3. A RESILIENT FLEXIBLE CONNECTOR INSTALLED IN ACCORDANCE WITH STANDARD DETAIL R-223C MAY BE USED TO SATISFY THE REQUIREMENTS OF NOTE 2 ABOVE.
4. ALL PIPE OPENINGS TO NEW MANHOLES MUST BE EITHER CAST-IN-PLACE OR PRE-FORMED AND PIPE OPENINGS TO EXISTING MANHOLES MUST BE CORE DRILLED.



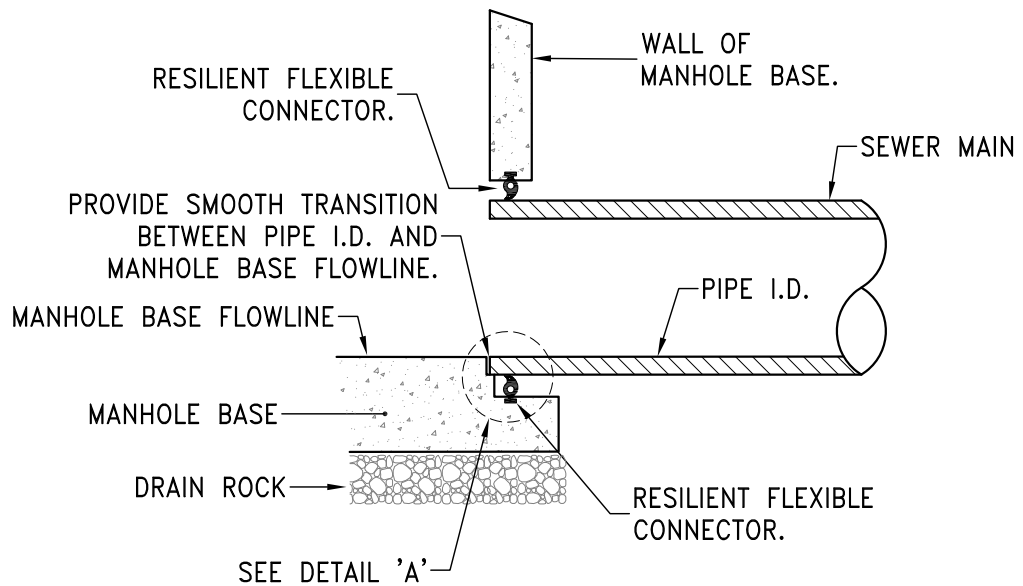
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## STORM DRAIN PIPE TO MANHOLE CONNECTION

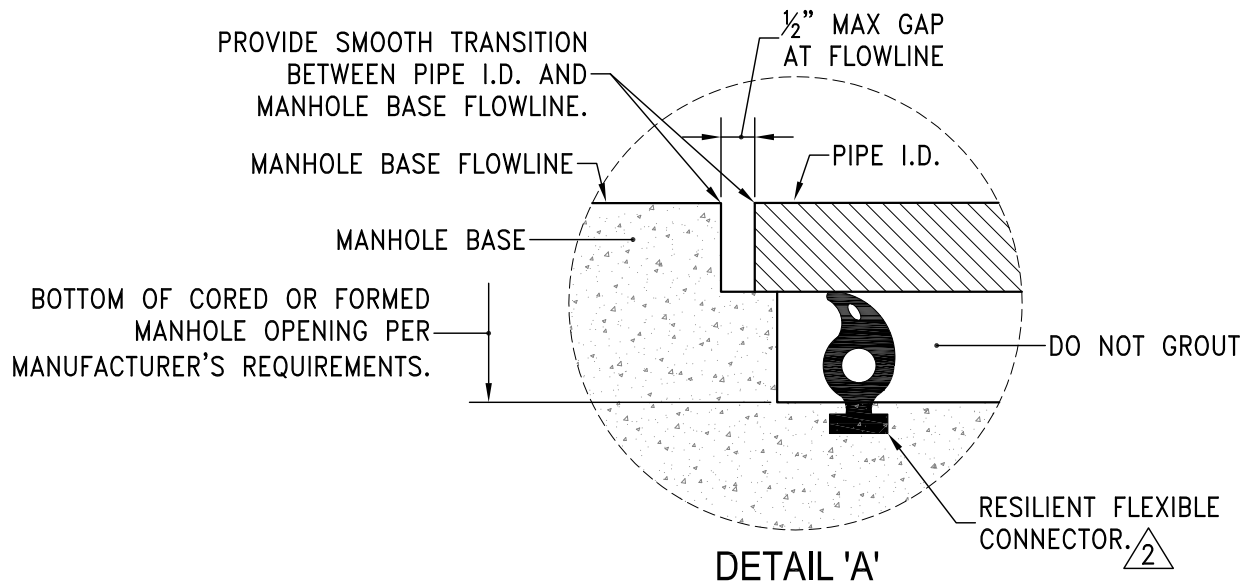
DRAWING No.

R-223B

APPROVED BY: JF DATE: 4/2014



## SECTION



## NOTES:

1. A SEAL OR WATER STOP IS REQUIRED ON ALL SANITARY SEWER INSTALLATIONS AND IN OTHER APPLICATIONS AS REQUIRED BY THE CITY TO PROVIDE A WATERTIGHT CONNECTION.
2. A RESILIENT FLEXIBLE CONNECTOR PER ASTM C 923-89 SHALL BE USED AT THE MANHOLE/PIPE CONNECTION TO SATISFY THE REQUIREMENTS OF NOTE 1. FOR PRE-CAST CONCRETE STRUCTURES, THE RESILIENT FLEXIBLE CONNECTOR SHALL BE AN "A-LOK" TYPE PIPE-TO-MANHOLE CONNECTOR OR APPROVED EQUAL. FOR CAST-IN-PLACE STRUCTURES, THE RESILIENT FLEXIBLE CONNECTOR SHALL BE A "KOR-N-SEAL I - TOGGLE KORBAND" TYPE PIPE-TO-MANHOLE CONNECTOR OR APPROVED EQUAL.
3. THE INTERIOR MANHOLE CONNECTION SHALL HAVE A SMOOTH TRANSITION BETWEEN PIPE I.D. AND MANHOLE BASE FLOWLINE. NO GROUT OR CONCRETE SHALL BE PLACED AROUND THE RESILIENT FLEXIBLE CONNECTOR.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## RESILIENT FLEXIBLE CONNECTOR

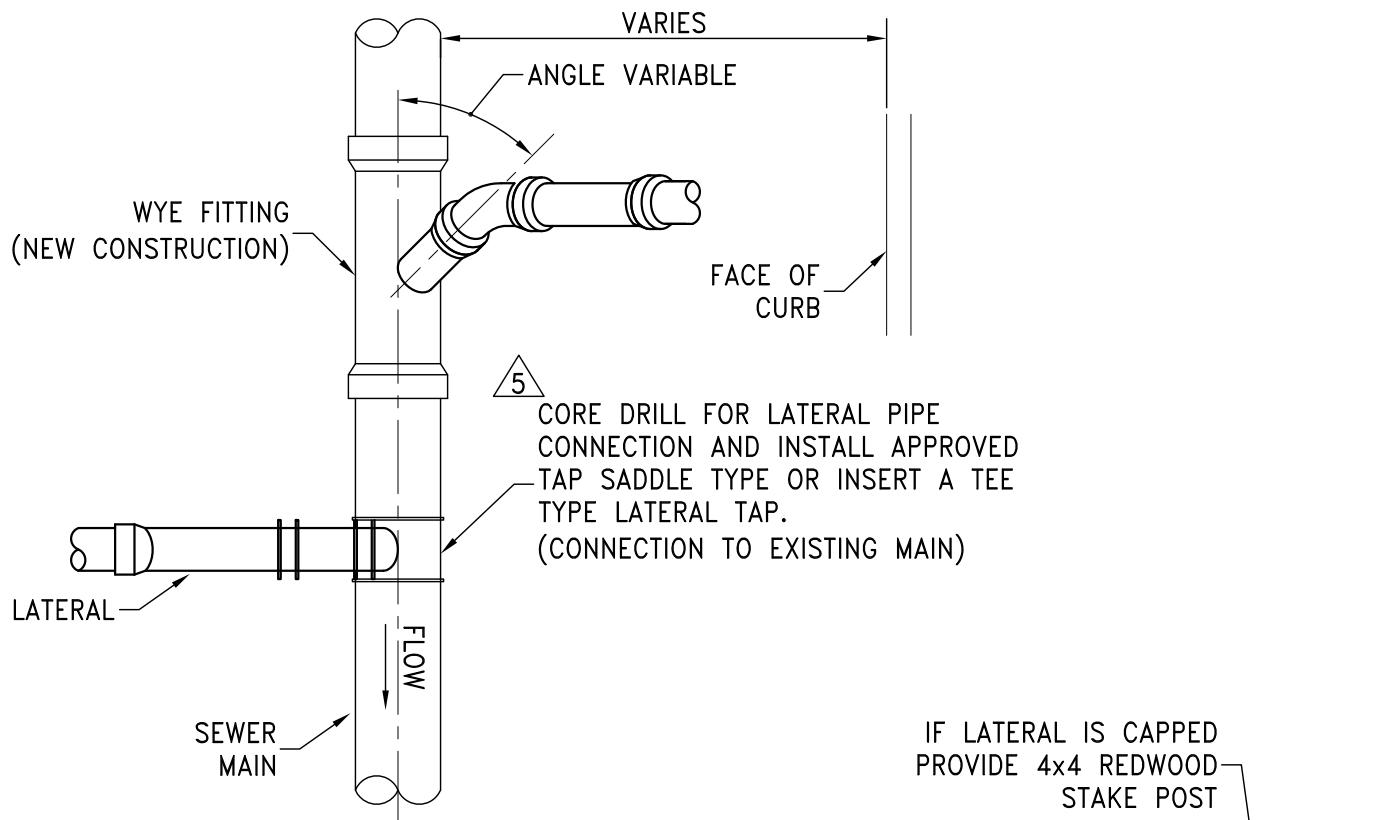
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R-223C

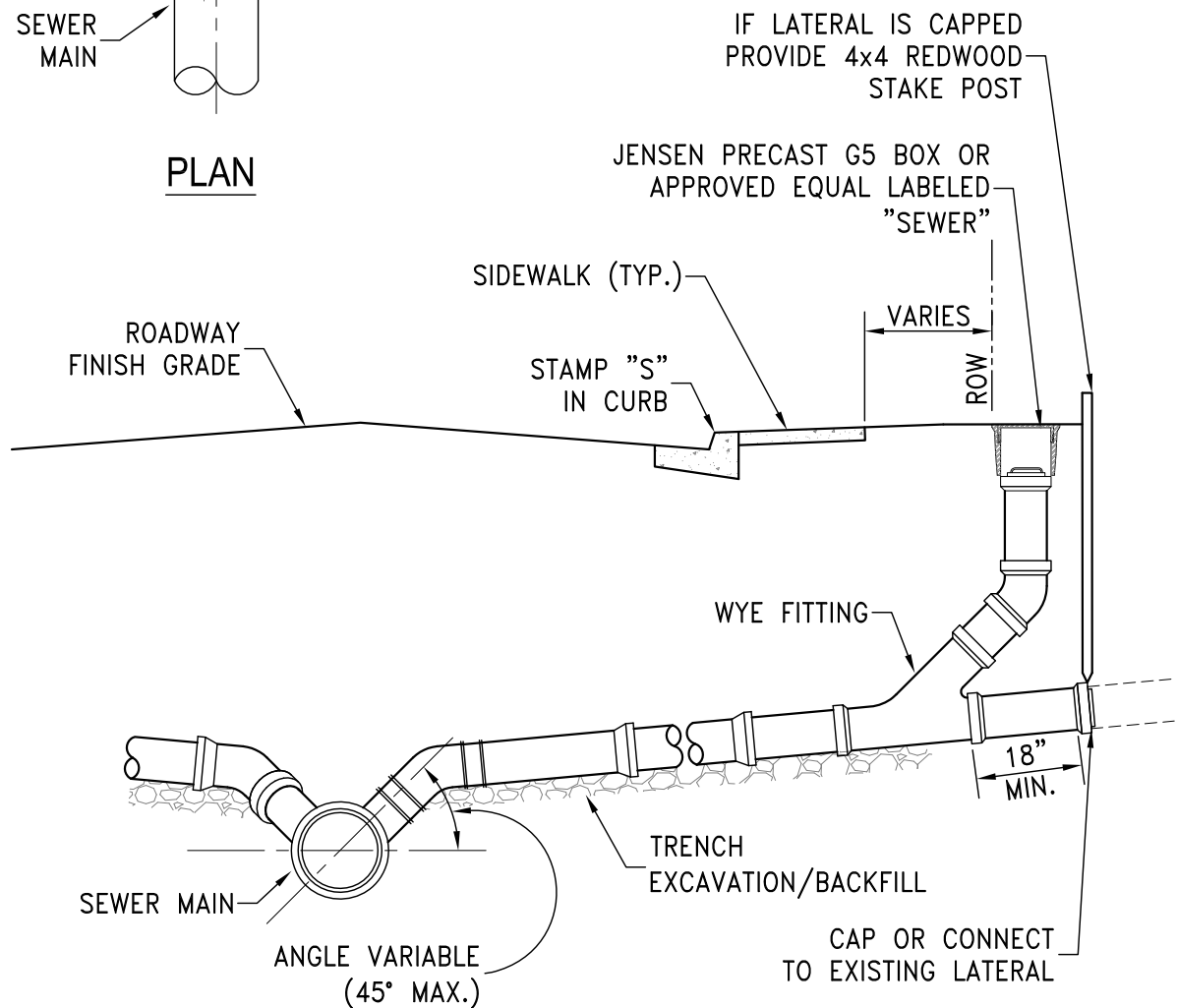
APPROVED BY: JF

DATE: 4/2014

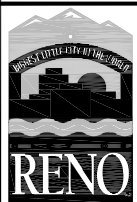




PLAN



SECTION



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

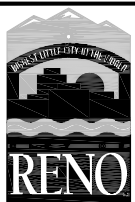
# SANITARY SEWER LATERAL

R-224A

APPROVED BY: JF DATE: 1/2013

NOTES:

1. SEWER LATERALS SHALL HAVE A MINIMUM PIPE DIAMETER OF 4-INCHES.
2. ALL PLASTIC PIPE USED FOR SEWER SERVICE LATERAL CONSTRUCTION SHALL BE SOLID WALL AND SHALL MEET THE REQUIREMENTS OF D-2412, HAVE A MINIMUM STIFFNESS OF 46 PSI AS DEFINED BY THE REQUIREMENTS OF ASTM D-3034.
3. SERVICE LATERALS SHALL HAVE A MINIMUM SLOPE OF 1/4-INCH PER FOOT UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
4. SEWER LATERALS SHALL HAVE A MINIMUM COVER OF 36-INCHES IN THE PUBLIC RIGHT-OF-WAY AND IN EASEMENTS UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. THE DEFINITION OF "COVER" IS THE DISTANCE FROM THE TOP OF PIPE TO FINISHED GRADE.
5. USE OF SEWER SERVICE TAP SADDLE CONNECTIONS SHALL NOT BE ALLOWED FOR NEW SEWER MAIN CONSTRUCTION. WHEN A TAP SADDLE CONNECTION IS TO BE USED ON AN EXISTING SEWER MAIN, IT SHALL BE A WYE SADDLE AND BE INSTALLED PER DETAIL R-224C.
6. SEWER LATERALS SHALL HAVE A CLEANOUT INSTALLED IMMEDIATELY UPSTREAM OF THE POINT WHERE THE SERVICE LATERAL EXITS THE PUBLIC RIGHT-OF-WAY OR EASEMENT. A G5 BOX CLEARLY MARKED "SEWER" SHALL BE INSTALLED OVER THE TOP OF THE CLEANOUT RISER CAP PIPE.
7. SEWER LATERALS SHALL NOT BE CONNECTED DIRECTLY TO OR WITHIN 5- FEET OF A MANHOLE STRUCTURE.
8. EXISTING SEWER LATERALS SHALL BE CUT BACK TO SOUND MATERIAL FOR COUPLING. PLACE 6-INCH THICK CONCRETE PAD UNDER CONNECTION.
9. SEWER LATERAL CONNECTION SHALL BE STABILIZED WITH APPROVED MATERIAL FOLLOWING INSTALLATION. CONNECTION TO CITY SEWER MAIN MUST BE INSPECTED BY THE CITY PRIOR TO BACKFILL.
10. NO LATERAL CONNECTIONS SHALL BE MADE DIRECTLY TO A SANITARY SEWER "INTERCEPTOR" UNLESS APPROVED BY THE CITY ENGINEER.
11. SEWER LATERALS SHALL NOT BE CONNECTED TO A SEWER MAIN UNLESS THE CONNECTION POINT IS BETWEEN TWO MANHOLE STRUCTURES.
12. EACH INDIVIDUAL PARCEL SHALL HAVE A MINIMUM OF ONE SEWER LATERAL. TWO OR MORE PARCELS SHALL NOT SHARE ONE SEWER LATERAL.
13. SANITARY SEWER LATERAL IDENTIFICATION AND LOCATING REQUIREMENTS SHALL BE PER RENO MUNICIPAL CODE 12.18 (RMC 12.18).
14. DISCONTINUANCE OF USE OF AN EXISTING SEWER LATERAL REQUIRES ABANDONMENT OF THE LATERAL. CUT, REMOVE 1-FOOT OF EXISTING LATERAL AND CAP BOTH ENDS OF THE EXISTING SEWER LATERAL TO BE ABANDONED WITHIN 6-INCHES OF THE SEWER MAIN. ABANDONMENT MUST BE INSPECTED BY CITY PRIOR TO BACKFILL.
15. PROPERTY OWNER SHALL BE RESPONSIBLE FOR OPERATION, MAINTENANCE AND REPAIR OF THE SEWER LATERAL WITHIN THE PUBLIC RIGHT-OF-WAY PER RENO MUNICIPAL CODE.



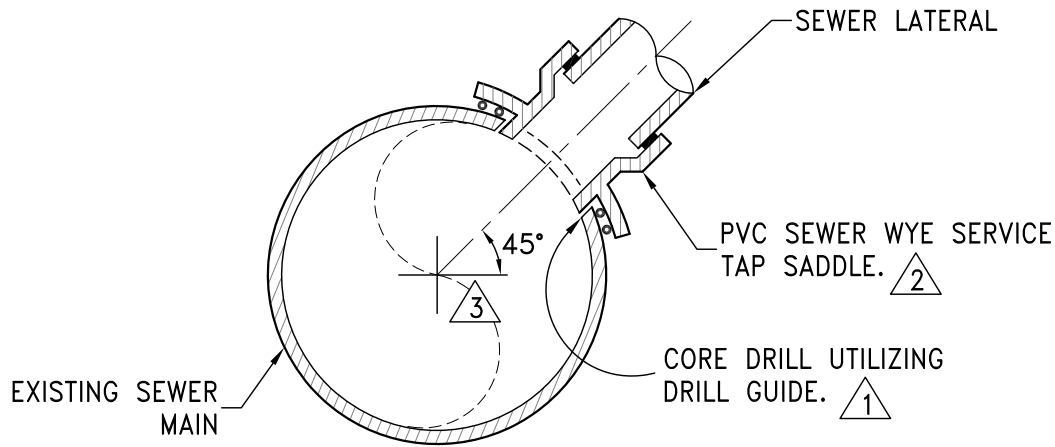
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**NOTES - SANITARY SEWER  
LATERAL**

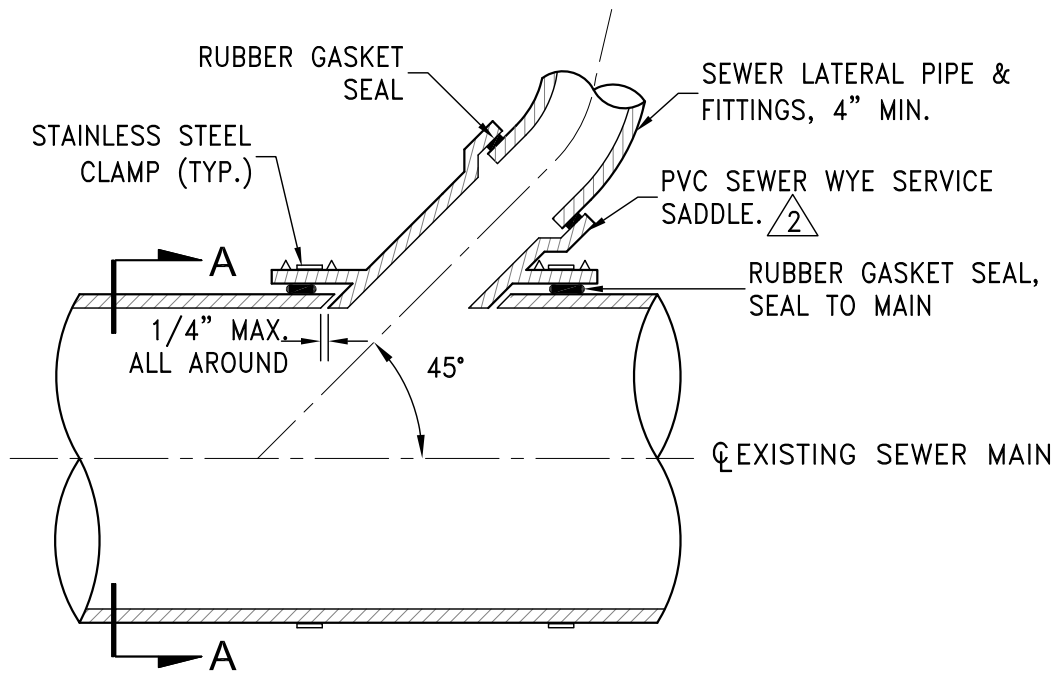
DRAWING No.

**R-224B**

APPROVED BY: JF      DATE: 1/2013



**SECTION A-A**



**SIDE VIEW**

**NOTES:**

1. EXISTING SEWER MAINS SHALL BE CORE DRILLED UTILIZING A DRILL GUIDE FOR A WYE SADDLE AND A CORE DRILL WITH A LENGTH EXCEEDING THE LATERAL DIAMETER, INSERT-A-DRILL IDY75 & EXTRA LONG HOLE SAW OR APPROVED EQUAL. DIAMOND CORE BITS SHALL BE USED ON NON-PVC MAINS.
2. SERVICE TAP SADDLES SHALL BE PVC SEWER WYE SADDLES. A ROMAC STYLE "CB" SEWER SADDLE OR APPROVED EQUAL MAY BE USED ON EXISTING SEWER MAINS ONLY WHEN MAIN IS NOT PVC.
3. SADDLES SHALL BE INSTALLED AT 45 DEGREES TO MAIN AS SHOWN IN SECTION A-A. IN NO CASE SHALL A LATERAL CONNECTING TO THE EXISTING SEWER MAIN BE LOCATED DIRECTLY ON TOP OF THE PIPE, NOR SHALL IT MATCH THE FLOWLINE OF THE PIPE.



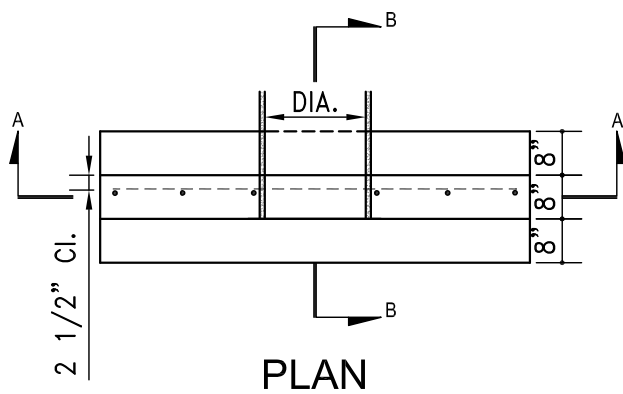
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

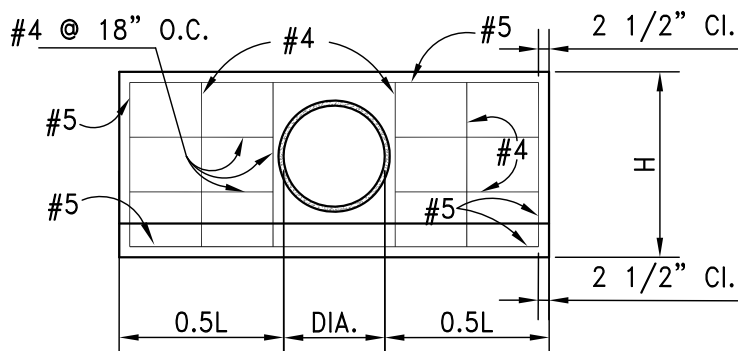
**SANITARY SEWER  
TAP SADDLE**

**R-224C**

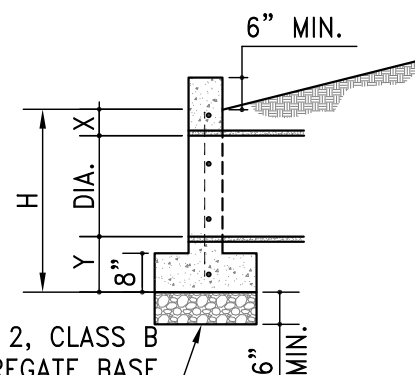
APPROVED BY: JF DATE: 1/2013



PIPE DIA.	X	Y	L	H
12"	0'-10"	1'-2"	4'-0"	3'-0"
15"	0'-10 1/4"	1'-2 1/4"	5'-0"	3'-3 1/2"
18"	0'-10 1/2"	1'-2 1/2"	5'-9"	3'-7"
21"	0'-10 3/4"	1'-2 3/4"	6'-6"	3'-10 1/2"
24"	0'-11"	1'-3"	7'-3"	4'-2"
27"	0'-11"	1'-3"	8'-0"	4'-5"
30"	0'-11 1/2"	1'-3 1/2"	9'-0"	4'-9"
33"	0'-11 3/4"	1'-3 3/4"	4'-0"	5'-1 1/2"
36"	1'-0"	1'-4"	10'-6"	5'-4"



**SECTION A-A**

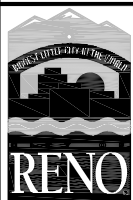


6" MIN. TYPE 2, CLASS B  
AGGREGATE BASE  
COMPACTED TO A MINIMUM  
95% RELATIVE COMPACTION

**SECTION B-B**

**NOTES:**

- FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
- REINFORCING STEEL SHALL BE DEFORMED BARS WITH MAXIMUM SPACING OF 18" SET 2 1/2" CLEAR OF SURFACE OF CONCRETE EXCEPT AS NOTED. BAR ENDS SHALL BE KEPT 1 1/2" CLEAR OF SURFACE OF CONCRETE. REINFORCING BARS MAY BE CUT AND BENT IN FIELD.
- FOOTINGS SHOWN ARE OF MINIMUM DEPTH AND SHALL BE EXTENDED IF SOIL IS UNSUITABLE OR LIABLE TO SCOUR.
- CULVERT PIPES TO BE SET ON A SKEW SHALL BE MITERED WHEN HEADWALLS ARE CONSTRUCTED.
- DIMENSIONS X, Y, L, AND H TO REMAIN CONSTANT REGARDLESS OF MINOR VARIATIONS IN WALL THICKNESS DUE TO CLASS OF PIPE USED.
- SKEWED HEADWALLS, HEADWALLS FOR DOUBLE PIPES OR FOR PIPES GREATER THAN 36" SHALL BE DESIGNED BY A STRUCTURAL ENGINEER AND SUBMITTED TO THE CITY FOR APPROVAL.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

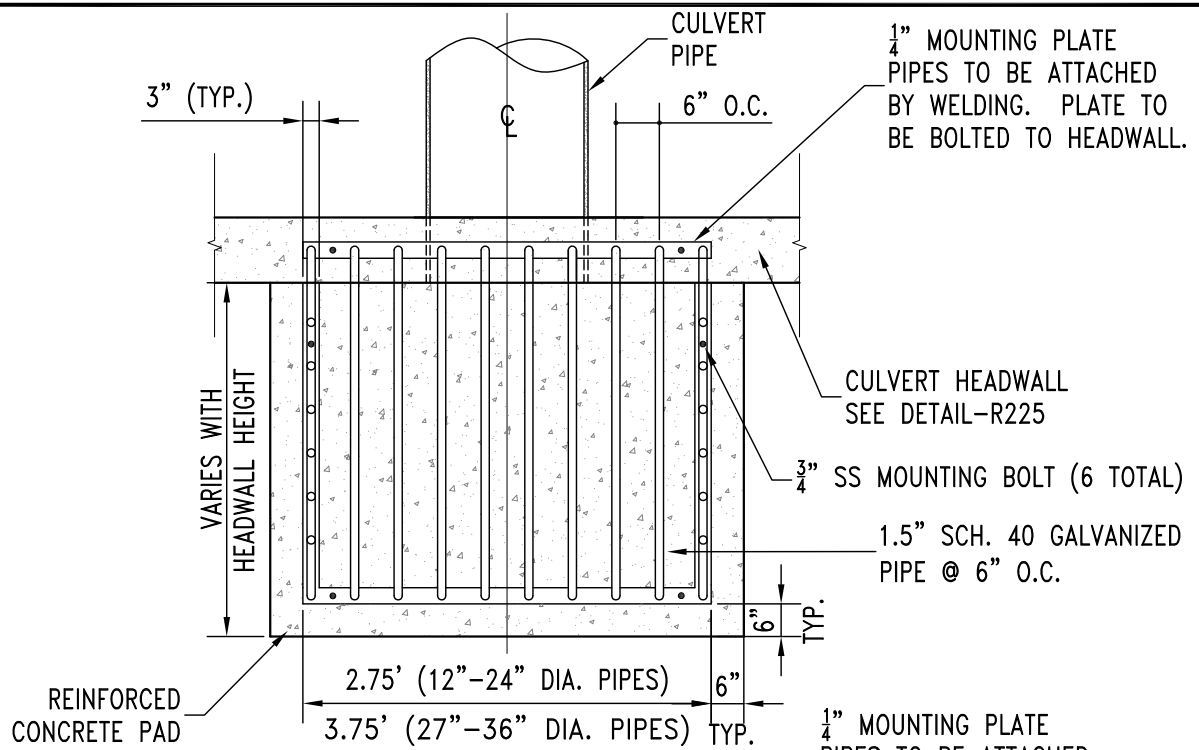
**CULVERT HEADWALL**

DRAWING No.

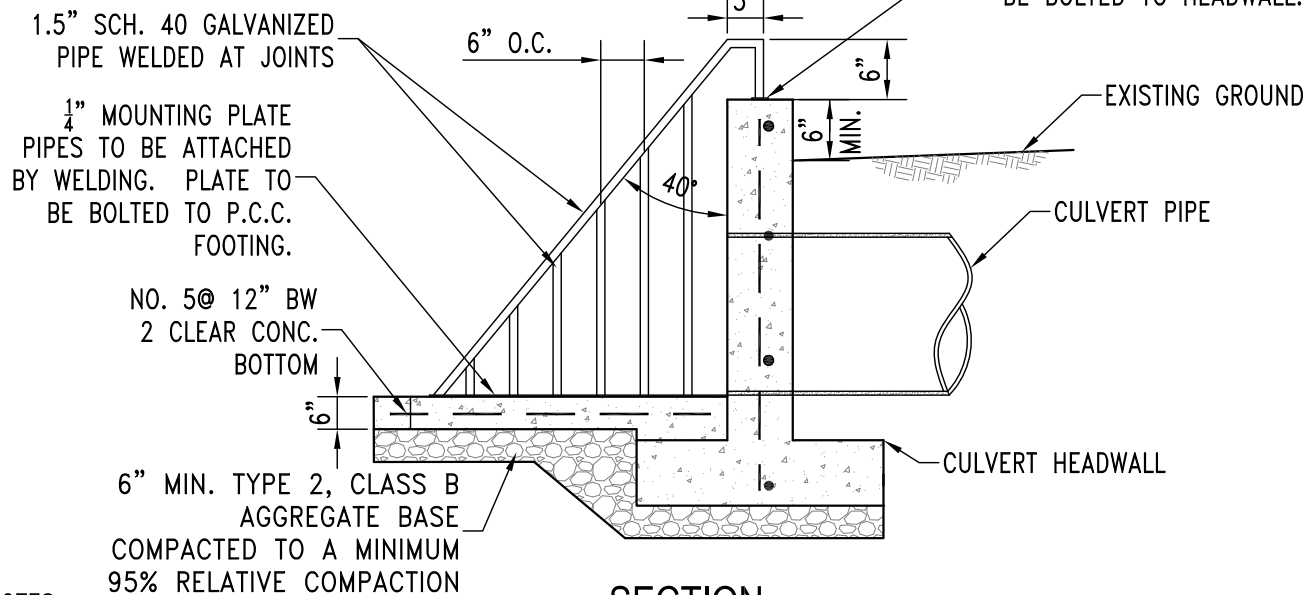
**R-225**

APPROVED BY: JF

DATE: 1/2013



### PLAN



### SECTION

#### NOTES:

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. ALL METAL PARTS SHALL BE GALVANIZED AFTER WELDING.
3. ENGINEERS SHALL SUBMIT DETAILED PLANS FOR PIPES DIAMETERS GREATER THAN 36" OR WHEN REQUIRED BY THE CITY ENGINEER.



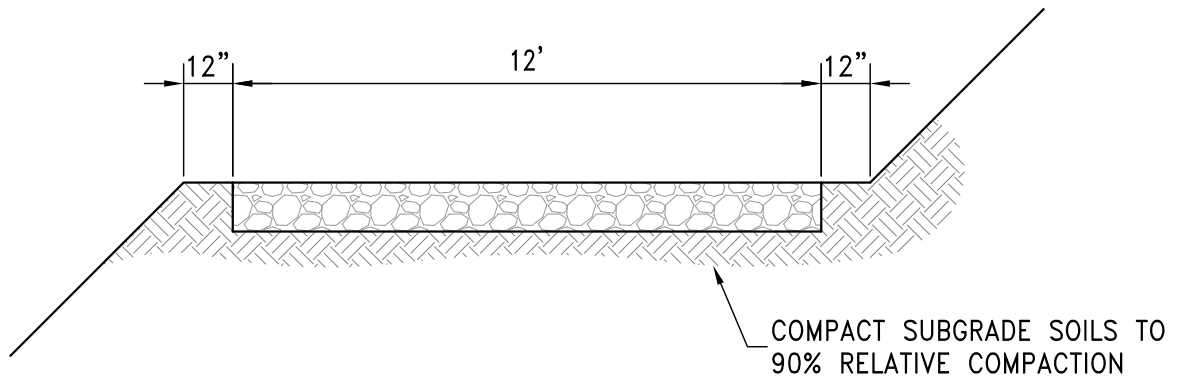
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

## HEADWALL TRASH RACK

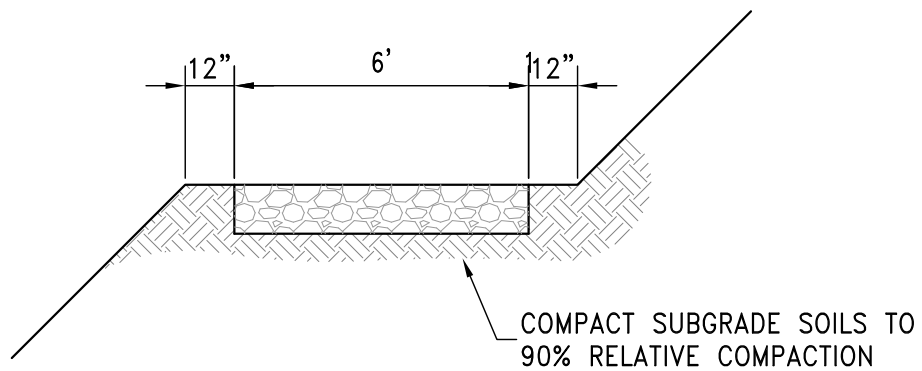
DRAWING No.

R-226

APPROVED BY: JF DATE: 1/2013



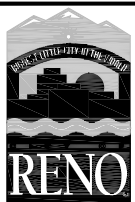
### ACCESS TO SD INLETS 24" DIA. & LARGER



### ACCESS TO SD INLETS SMALLER THAN 24" DIA. & ALL OUTLETS

#### NOTES:

1. 12' WIDE 6"-8" Ø COBBLE STONE LAID TO BE A "DRIVEABLE" SURFACE TO THE SATISFACTION OF THE CITY WITH HAMMERHEAD VEHICLE TURNAROUNDS.
2. 6' WIDE 6"-8" Ø COBBLE STONE LAID TO BE A "DRIVEABLE" SURFACE TO THE SATISFACTION OF THE CITY.



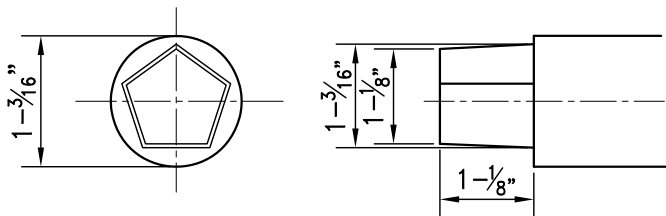
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**STORM DRAIN ACCESS ROADS  
(FOR HILLSIDE DEVELOPMENT)**

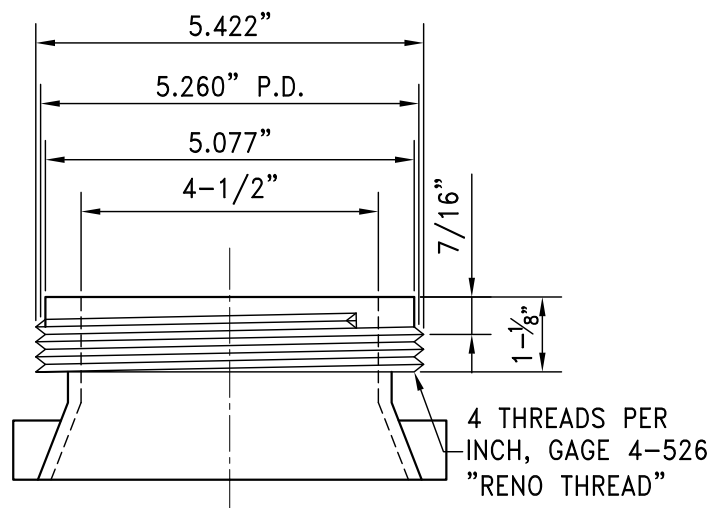
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**R-227**

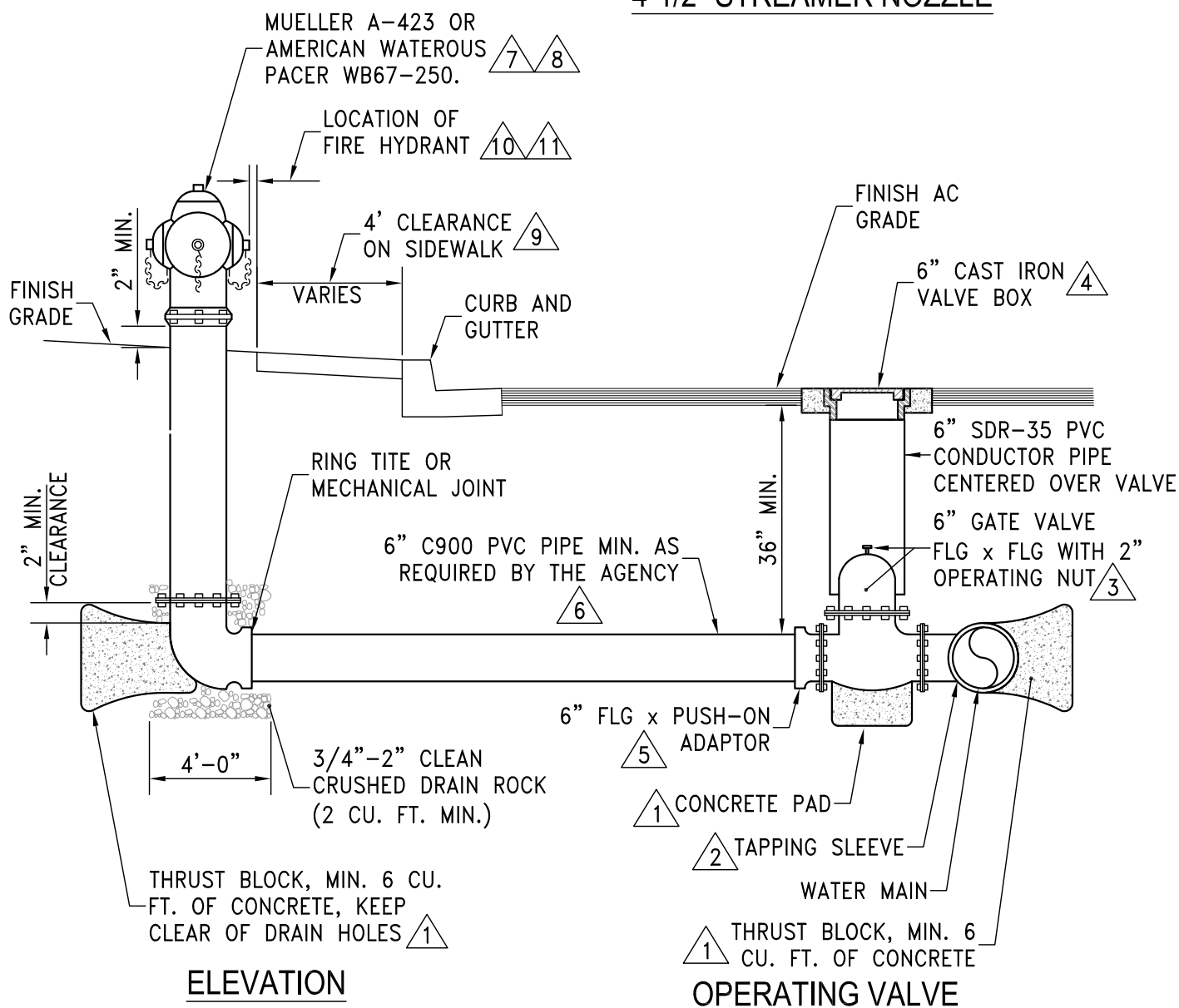
APPROVED BY: JF DATE: 1/2013



**OPERATING NUT - PENTAGON**

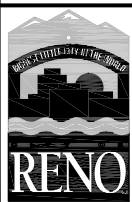


**4-1/2" STREAMER NOZZLE**



**ELEVATION**

**OPERATING VALVE**



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**FIRE HYDRANT**

**R-301A**

APPROVED BY: JF DATE: 10/2014

NOTES:

1.

FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.

2.

TAPPING SLEEVE

HOT-TAP TAPPING SLEEVES SHALL BE FULL-CIRCLE ASTM A 240, TYPE 304 STAINLESS STEEL WITH FULL CIRCUMFERENCE GASKETS THROUGHOUT SLEEVE LENGTH WITH AWWA C207 CLASS D ANSI 150 LB. DRILLING ASTM A 240, TYPE 304 STAINLESS STEEL FLANGE. TYPE 304 STAINLESS STEEL STUD BOLTS, HEAVY HEX NUTS, AND WASHERS SHALL BE INCLUDED. HEAVY HEX NUTS AND STUD BOLTS SHALL BE COATED TO PREVENT GALLING. TYPE 304 STAINLESS STEEL TEST PLUG SHALL BE INCLUDED WITH THREADS COATED TO PREVENT GALLING. TAPPING SLEEVE SHALL BE RATED FOR A TEST PRESSURE OF 300 PSI AND WORKING PRESSURE OF 200 PSI. TAPPING SLEEVE SHALL BE ROMAC STYLE "SST" STAINLESS STEEL TAPPING SLEEVE AS MANUFACTURED BY ROMAC INDUSTRIES, INC.; SMITH-BLAIR 663 STAINLESS STEEL FLANGE TAPPING SLEEVE AS MANUFACTURED BY SMITH-BLAIR, INC.; OR EQUAL.

ALL WATER MAIN SHUT DOWNS AND/OR INSTALLATION OF TAPPING SLEEVES SHALL BE COORDINATED WITH TRUCKEE MEADOWS WATER AUTHORITY (TMWA) AND CONFORM TO TMWA REQUIREMENTS.

3.

GATE VALVE

GATE VALVE SHALL BE 6-INCH, FLG X FLG AND SHALL MEET AWWA C515, DUCTILE IRON BODY, NON-RISING STEM, RESILIENT-SEATED VALVE. GATE VALVE SHALL BE EQUIPPED WITH A 2-INCH OPERATING NUT FOR BURIED SERVICE. GATE VALVE SHALL BE FUSION EPOXY LINED AND COATED. ALL VALVES FOR BURIED SERVICE SHALL BE POLYETHYLENE ENCASED PER AWWA C105. GATE VALVE SHALL BE A MUELLER A-2361 RESILIENT WEDGE GATE VALVE; AMERICAN AVK COMPANY SERIES 65 AWWA C515 DUCTILE IRON GATE VALVE; OR EQUAL.

4.

6" VALVE BOX SHALL BE D&L #8044 & #8056 OR APPROVED EQUAL. CASTINGS SHALL BE CAST IRON GRAY AND MEET THE REQUIREMENTS OF ASTM A48-74, CLASS 30B, NO PAINT.

5.

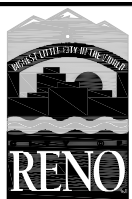
6-INCH FLG X PUSH-ON ADAPTER

6-INCH FLG X PUSH-ON ADAPTER SHALL BE DUCTILE IRON AND MEET THE REQUIREMENTS OF AWWA STANDARDS C110/C153 AND C104. ALL FITTINGS SHALL BE POLYETHYLENE ENCASED PER AWWA C105. ADAPTER SHALL BE ASPHALTIC COATED WITH CEMENT-MORTAR LINING PER AWWA C110/C153 AND C104.

6.

6-INCH C900 PVC LATERAL PIPE

C900 PVC WATER PIPE SHALL BE MANUFACTURED FROM NSF APPROVED COMPOUNDS CONFORMING TO ASTM D1784 WITH A CELL CLASSIFICATION OF 12454. C900 PVC WATER PIPE SHALL MEET ALL THE DIMENSIONAL, CHEMICAL, AND PHYSICAL REQUIREMENTS AS OUTLINED IN AWWA C900 AND WILL BE SUPPLIED IN 20 FOOT LAYING LENGTHS. JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3139 AND SHALL BE FORMED USING RIEBER TECHNOLOGY. GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. C900 PVC WATER PIPE SHALL BE PRESSURE CLASS 235 (DR 18) PER AWWA C900. C900 PVC WATER PIPE SHALL BE AS MANUFACTURED BY DIAMOND PLASTICS CORPORATION; VINYLTECH PVC PIPE; NORTH AMERICAN PIPE CORPORATION; OR EQUAL.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**NOTES - FIRE HYDRANT**

**R-301B**

APPROVED BY: JF

DATE: 10/2014



NOTES CONT:

7.

MUELLER A-423 WITH 5-1/4" VALVE OPENING OR AMERICAN WATEROUS PACER WB67-250 WITH 5-1/4" VALVE OPENING. RISER SHALL BE 4 FT OR 5 FT AND RISER TYPE SHALL BE SAME AS THE FIRE HYDRANT MANUFACTURE. HYDRANT SHALL BE ENAMEL RED. ALL HYDRANTS SHALL HAVE TWO 2 1/2" HOSE NOZZLES AND ONE 4 1/2" STREAMER NOZZLE.

8.

FIRE HYDRANTS SHALL BE INSPECTED BY CITY OF RENO FIRE DEPARTMENT INSPECTOR. INSPECTIONS SHALL BE SCHEDULED A MINIMUM OF TWO BUSINESS DAYS PRIOR AND INSPECTIONS SHALL BE PERFORMED DURING REGULAR BUSINESS HOURS. CONTACT CITY OF RENO PREVENTION BUREAU AT (775) 334-2300 TO SCHEDULE INSPECTIONS.

9.

FIRE HYDRANTS SHALL BE PLACED WITHIN THE RIGHT-OF-WAY OR EASEMENT GRANTED OUTSIDE THE RIGHT-OF-WAY. FIRE HYDRANT PLACED WITHIN PEDESTRIAN WALKWAY AND/OR SIDEWALKS SHALL PROVIDE FOR A MINIMUM OF 4 FT CLEARANCE IN ACCORDANCE WITH PUBLIC RIGHT-OF-WAY ACCESSIBILITY GUIDELINES (PROWAG).

10.

RENO FIRE DEPARTMENT APPROVAL IS REQUIRED FOR HYDRANT LOCATION WHERE NO SIDEWALK EXISTS BEHIND CURB OR WHERE A LANDSCAPE STRIP IS BETWEEN THE CURB AND THE SIDEWALK.

11.

NO FENCES, LANDSCAPE FEATURES, OR OTHER OBSTRUCTIONS SHALL BE ALLOWED WITHIN 3-FEET OF ANY PORTION OF A FIRE HYDRANT. CLEARANCE IS MEASURED FROM ALL OBSTRUCTIONS TO THE NEAREST POINT ON THE FIRE HYDRANT.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

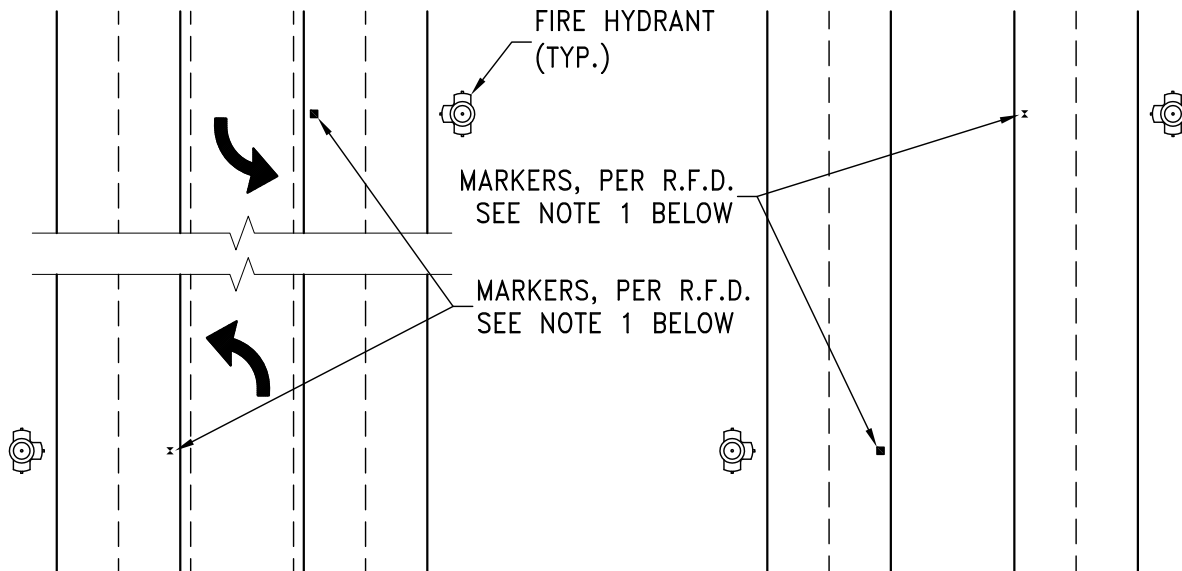
## NOTES - FIRE HYDRANT

DRAWING No.

R-301C

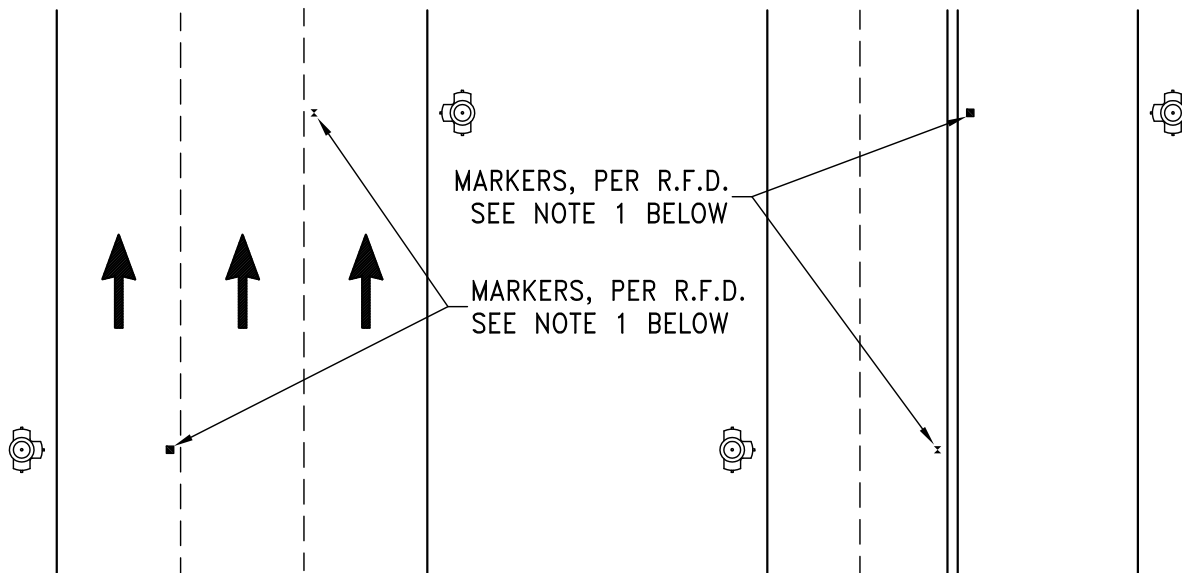
APPROVED BY: JF

DATE: 10/2014



STREETS WITH CENTER TURN LANE,  
MARKER IS PLACED 8" TO 12" OFF  
YELLOW SOLID LINE, TO THE SIDE OF  
THE HYDRANT.

STREETS WITH CENTER PLANTER OR  
CONCRETE ISLAND, MARKER IS PLACED  
8" TO 12" OFF CENTER ISLAND, OUT  
FROM HYDRANT.



ONE WAY STREETS: MARKER IS PLACED  
8" TO 12" OFF LINE IN FIRST LANE,  
OUT FROM HYDRANT.

2 LANE OR 4 LANE STREETS WITH  
CENTERLINE, MARKER IS PLACED 8" TO  
12" OFF CENTERLINE. RESIDENTIAL  
STREETS WITH NO LINES, PLACE  
MARKER 8" TO 12" OFF VISUAL  
CENTER, TO THE SIDE OF THE  
HYDRANT.

NOTES:

1. R.F.D. – RENO FIRE DEPARTMENT



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# FIRE HYDRANT MARKER LOCATIONS

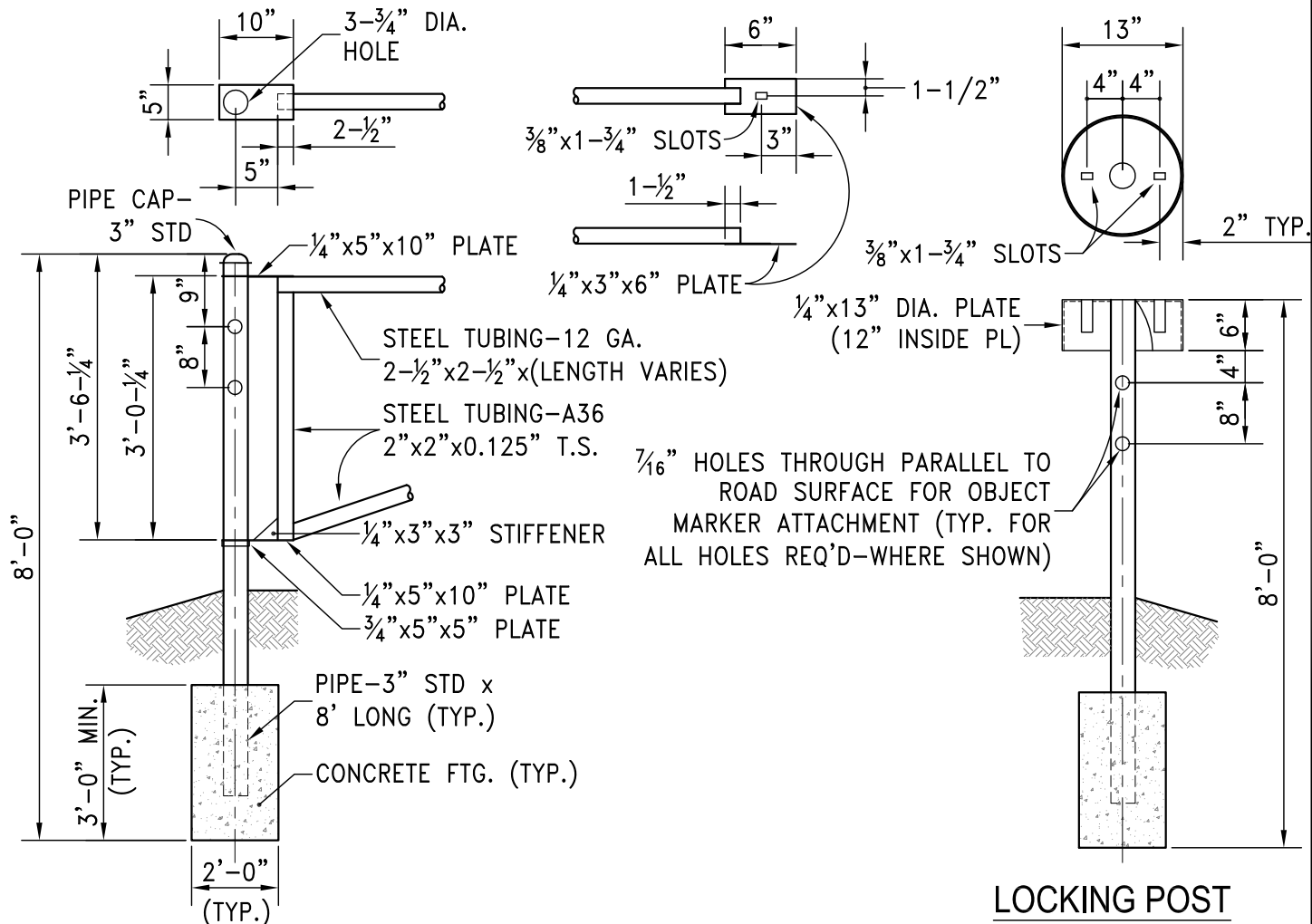
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R-302

APPROVED BY: JF DATE: 1/2013

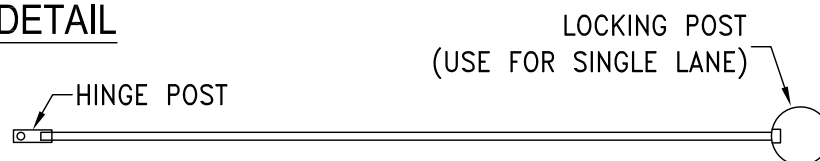
NOTE:

	STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION	DRAWING No.	
	STREET NAME SIGN	R-401	
		APPROVED BY: JF	DATE: 7/2013

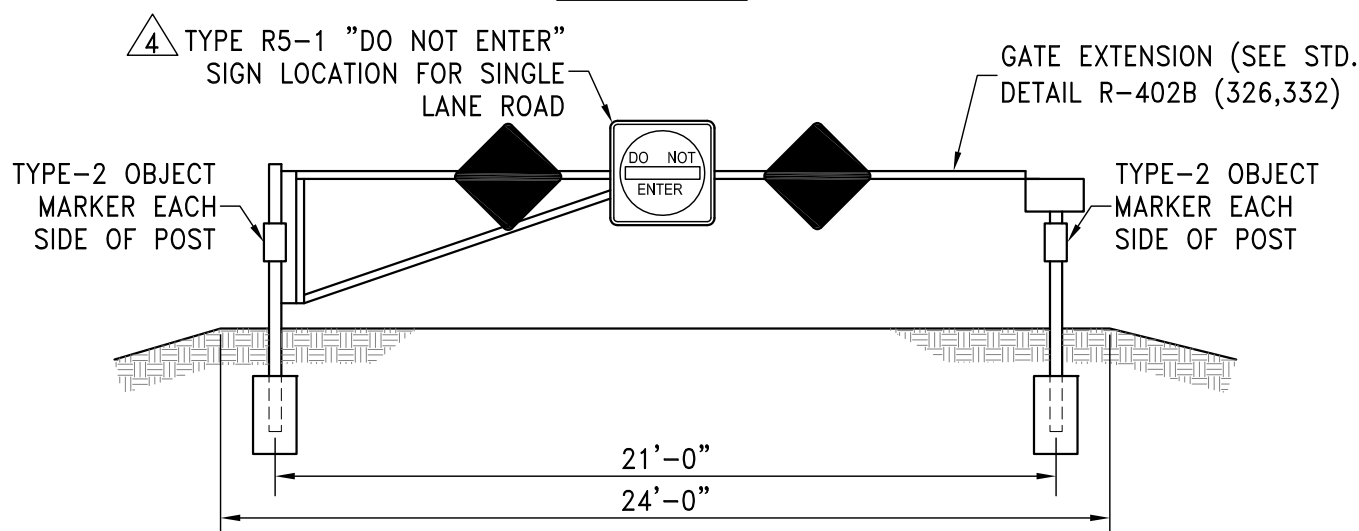


**HINGE POST DETAIL**

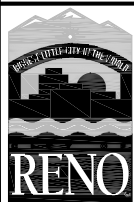
**LOCKING POST**



**PLAN VIEW**



**ELEVATION VIEW**



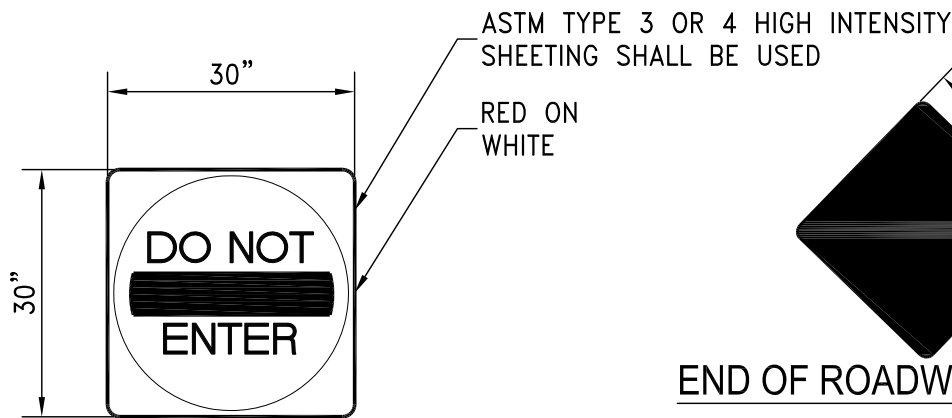
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# EMERGENCY ACCESS CONTROL GATE

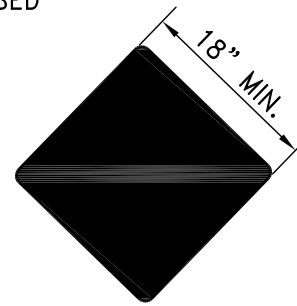
DRAWING No.

R-402A

APPROVED BY: JF DATE:1/2013



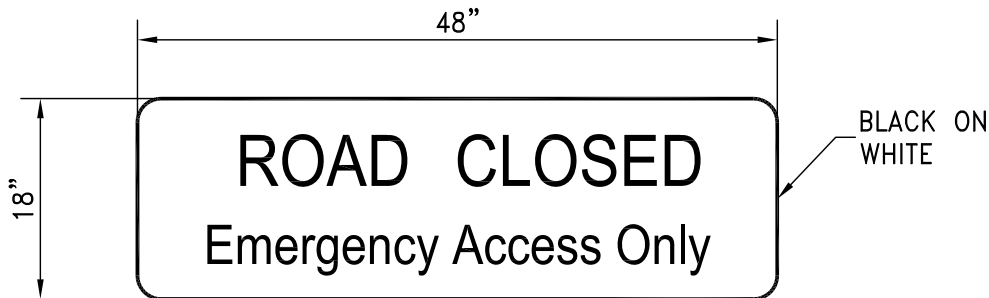
**DO NOT ENTER SIGN**  
TYPE R5-1



**END OF ROADWAY MARKER**

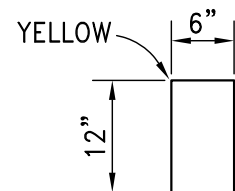
OM4-3

RETROREFLECTIVE RED DIAMOND PANEL.



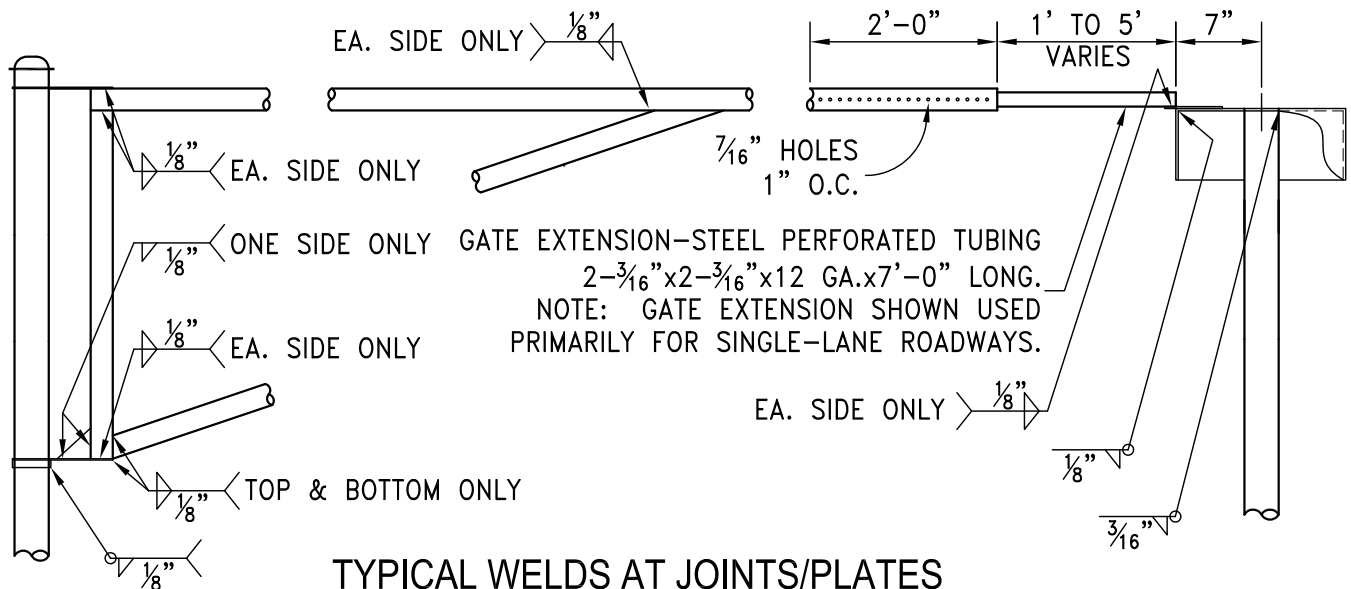
**EMERGENCY ACCESS ROAD CLOSED SIGN \*\***

\*\* UTILIZE THIS SIGN IN LIEU OF THE "DO NOT ENTER" SIGN WHEN ACCESS BY THE FIRE DEPARTMENT IS REQUIRED.

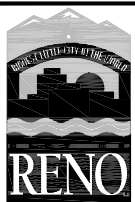


**OBJECT MARKER**

TYPE-2



**TYPICAL WELDS AT JOINTS/PLATES  
AND TYPICAL GATE EXTENSION**



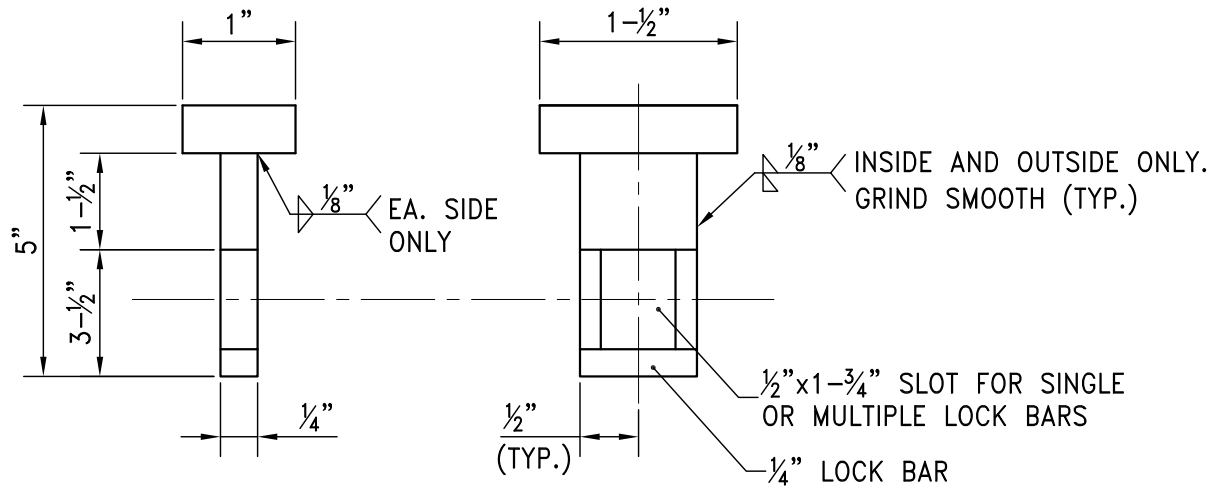
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# EMERGENCY ACCESS CONTROL GATE

DRAWING No.

R-402B

APPROVED BY: JF DATE: 1/2013



NOTES: (APPLY TO STD. DETAIL DWG. NOS. R-402A, R-402B AND R-402C)

1. ALL HOLES DRILLED THROUGH TO BE 7/16" DIAMETER. HOLES TYPICALLY DRILLED VERTICAL OR HORIZONTAL TO TRAVELED WAY SURFACE.
2. ALL THREADS OF ALL BOLTS USED ARE TO BE PEENED AFTER INSTALLATION/USAGE TO PREVENT BOLT REMOVAL.
3. ALL MEMBERS OF THE GATE ASSEMBLY SHALL BE FABRICATED FROM THE STANDARD STEEL SECTIONS. FABRICATED MEMBERS SHALL RECEIVE ONE SHOP COAT OF ALUMINUM PAINT AFTER FABRICATION. ALUMINUM PAINT SHALL CONFORM TO A.A.S.H.T.O. SPECIFICATION M69-70. HARDWARE SHALL BE CADMIUM PLATED.



SUBSTITUTE ITEM NO. 11 SIGN FOR ITEM NO. 6 SIGN WHEN ACCESS BY THE FIRE DEPARTMENT IS REQUIRED.

### MATERIALS LIST

ITEM NO.	NO. REQ'D	DESCRIPTION
1	1	GATES AND GATE EXTENSIONS
2	1	HINGE POST, WITH PIPE CAPS
3	1	MASTER LOCKING PINS
4	1	LOCKING POST
5	2	OM4-3 END OF ROADWAY MARKER
6	1	18"X30" ROAD CLOSED SIGN
7	4	6"X12" TYPE-2 OBJECT MARKERS
8	2	3/8"X3" MACHINE BOLT FOR GATE EXTENSIONS
9	6	3/8"X4" CARRIAGE BOLT WITH 1 CUT AND 1 LOCK WASHER FOR SIGNS ON GATES
10	6	3/8"X6" CARRIAGE BOLT WITH 1 CUT AND 1 LOCK WASHER FOR OBJECT MARKERS
11	1	18"X48" ROAD CLOSED EMERGENCY ACCESS ONLY SIGN



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

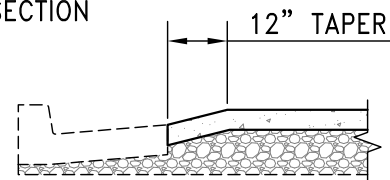
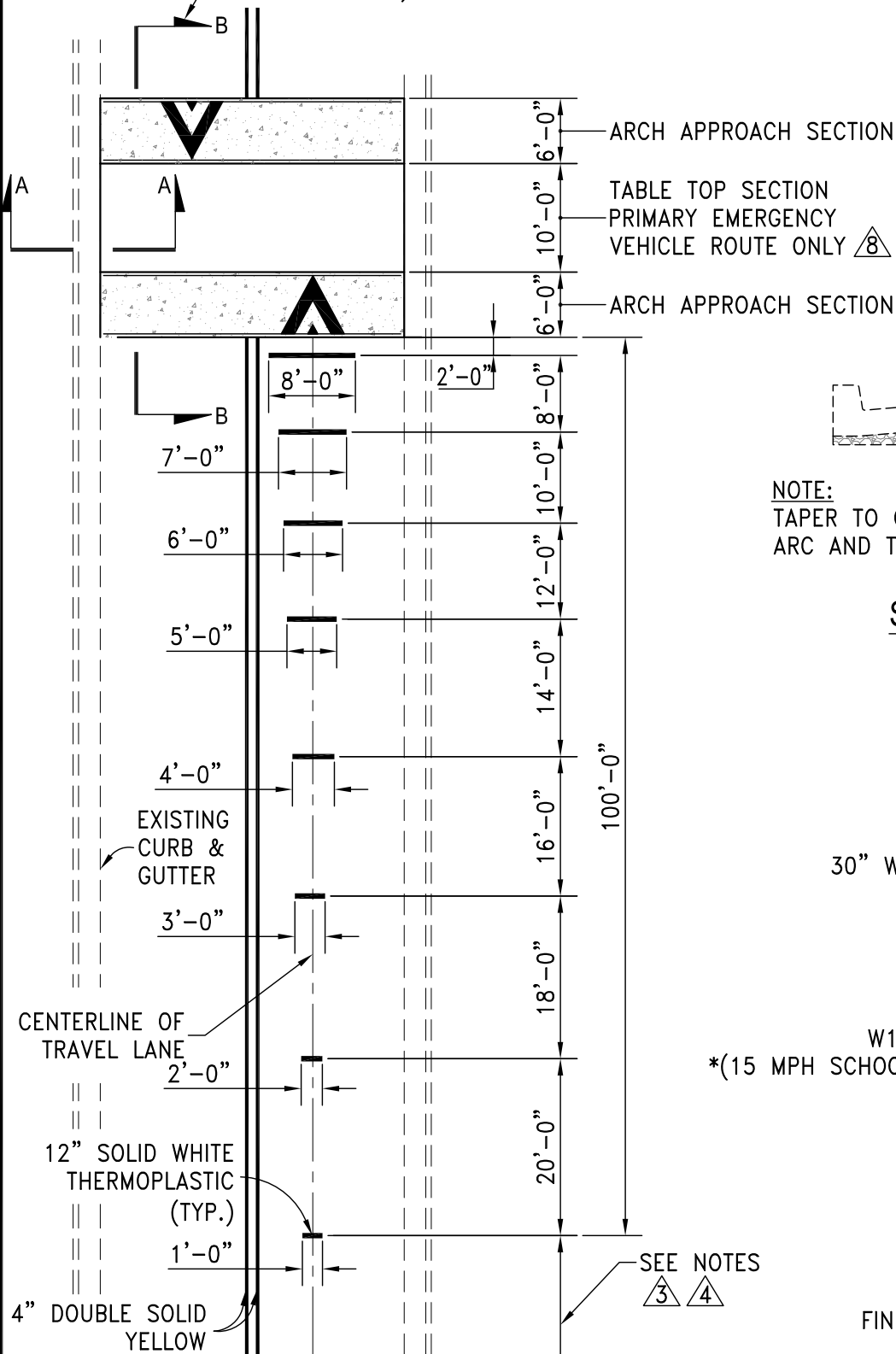
## EMERGENCY ACCESS CONTROL GATE

DRAWING No.

R-402C

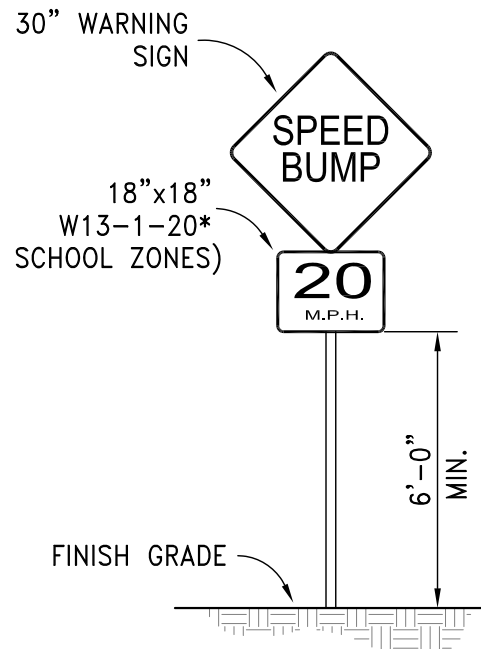
APPROVED BY: JF DATE: 1/2013

SECTION B-B (SEE STANDARD  
DETAIL R-403B)



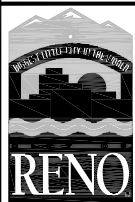
NOTE:  
TAPER TO CONTINUE THROUGH APPROACH  
ARC AND TABLE TOP SECTIONS

### SECTION A-A



### PLAN - STRIPING AND SIGNAGE (TYP. FOR BOTH DIRECTIONS)

### SIGN DETAIL 1



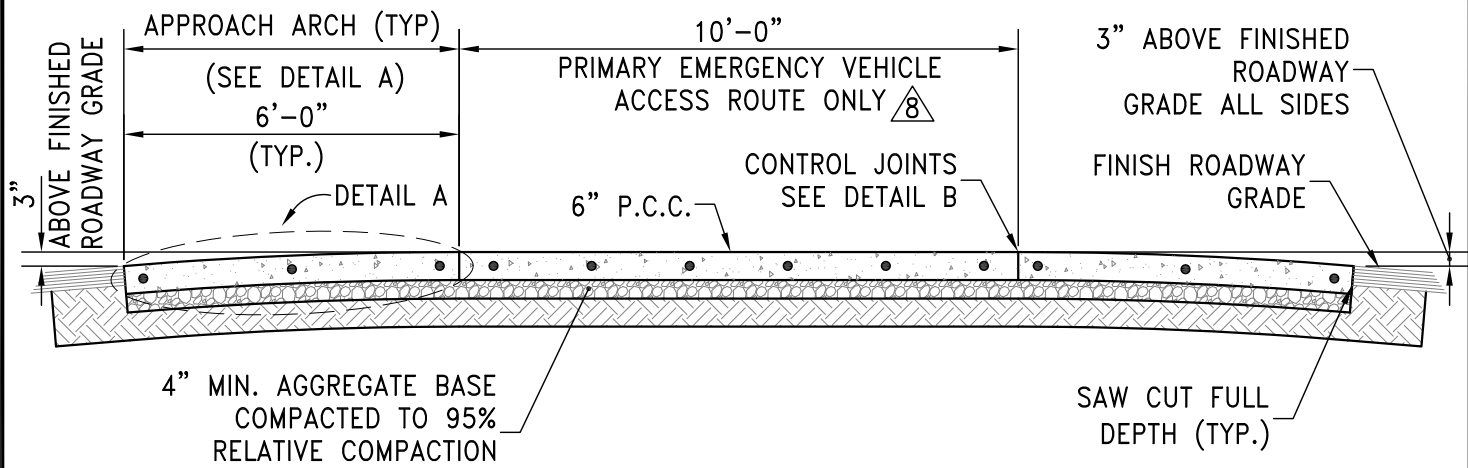
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

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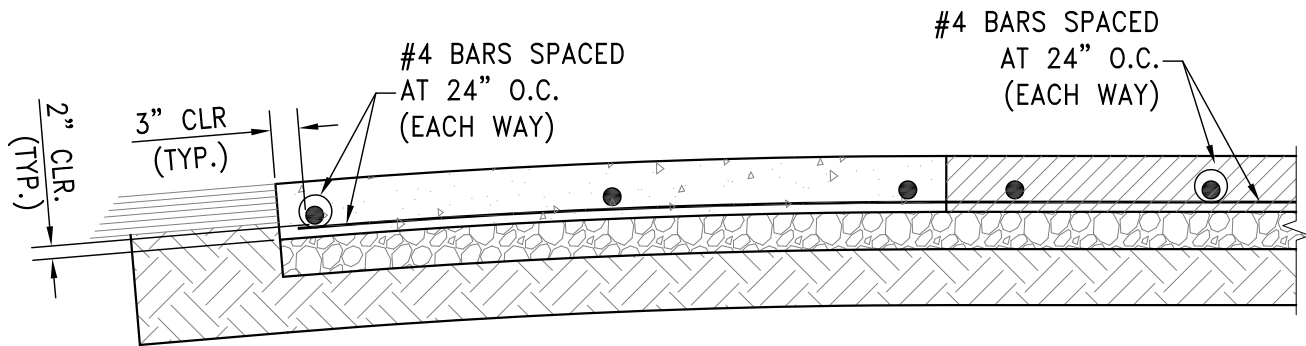
# SPEED BUMP LAYOUT, SIGNAGE AND STRIPING

R-403A

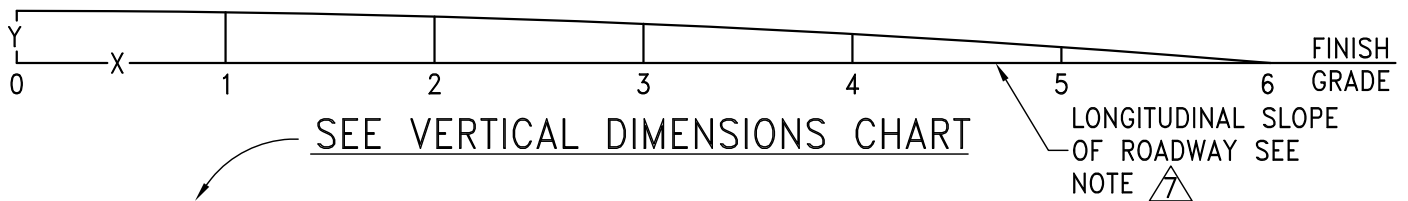
APPROVED BY: JF DATE: 1/2013



**SECTION B-B**  
**SPEED TABLE LONGITUDINAL PROFILE**

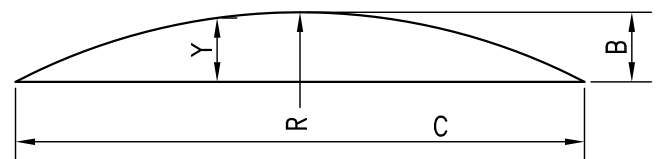


**DETAIL A**



\* **VERTICAL DIMENSIONS CHART**

X(FT.)	Y(FT.)=INCHES
0	0.250=3.00
1	0.243=2.92
2	0.222=2.67
3	0.188=2.25
4	0.139=1.67
5	0.077=0.92
6	0.000=0.00



$$* R = \frac{4B^2 + C^2}{8B} = 72.125'$$

$B = \text{HEIGHT} = (0.25')$   
 $C = \text{CHORD DISTANCE} = (12')$



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

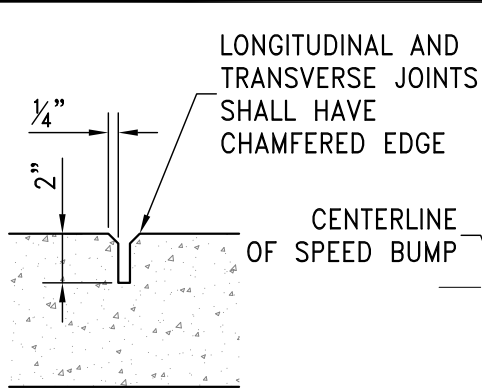
# SPEED BUMP CROSS SECTIONS

DRAWING No.

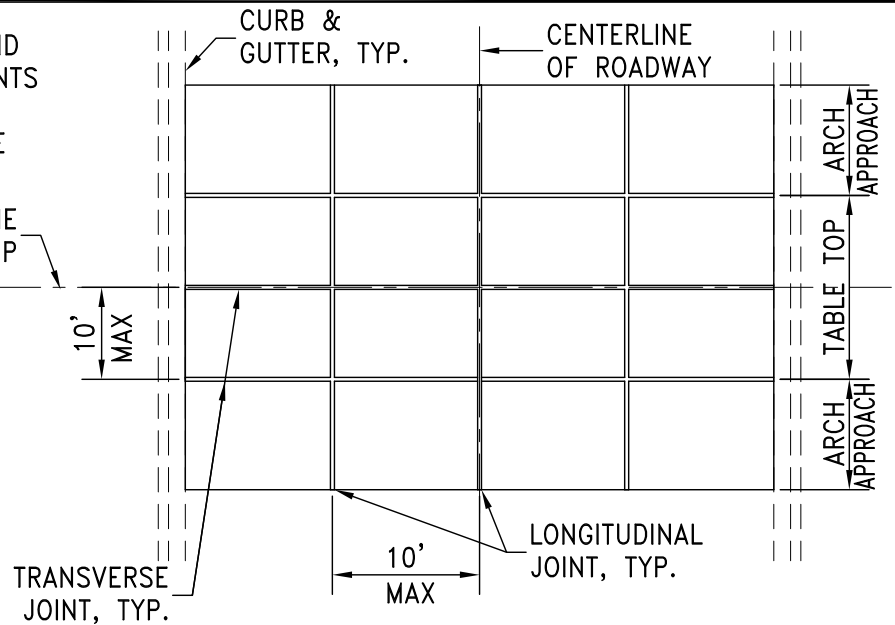
**R-403B**

APPROVED BY: JF | DATE: 1/2013





**DETAIL B (CONTROL JOINT)**



**CONTROL JOINT PATTERN**

**NOTES:**

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$ 1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.
2. AGGREGATE BASE MATERIAL UNDER SIDEWALKS SHALL BE TYPE 2, CLASS B CRUSHED AGGREGATE BASE. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. SIGN TO BE INSTALLED PER CITY OF RENO STANDARD DETAIL R-415.
4. EXACT LOCATION OF SPEED TABLE AND SIGNS TO BE VERIFIED BY THE ENGINEER PRIOR TO PLACEMENT.
5. LONGITUDINAL AND TRANSVERSE JOINTS TO BE CUT AT 10' MAX O.C. BEGINNING AT THE CENTERLINE. JOINTS SHALL BE CUT A MINIMUM OF 4 HOURS TO A MAXIMUM OF 12 HOURS AFTER THE CONCLUSION OF BRUSH FINISHING. SEE DETAIL B ABOVE.
6. FOR ROAD RECONSTRUCTION PROJECTS. SPEED TABLE SHALL BE PLACED AFTER THE ROADWAY HAS BEEN PAVED.
7. DIMENSIONS IN VERTICAL DIMENSIONS CHART ASSUME A LONGITUDINAL ROADWAY SLOPE OF 0.00%. IT IS THE INTENT OF THE DETAIL THAT THE 10' SECTION OF THE SPEED TABLE BE 3" ABOVE THE EXISTING ROADWAY ON ALL SIDES WITH THE EXCEPTION OF THE TAPER SECTION AT LIP LINE. MAXIMUM TOLERANCE ON SPEED TABLE TO BE  $\pm$ 1/4 INCH. SPEED TABLE OUT OF TOLERANCE MUST BE REMOVED AND REPLACED AS REQUIRED BY THE ENGINEER.
8. THE 10' TAPER SECTION IS TO BE USED ON PRIMARY EMERGENCY VEHICLE ACCESS ROUTES AND AT THE APPROVAL OF CITY OF RENO TRAFFIC ENGINEERING.



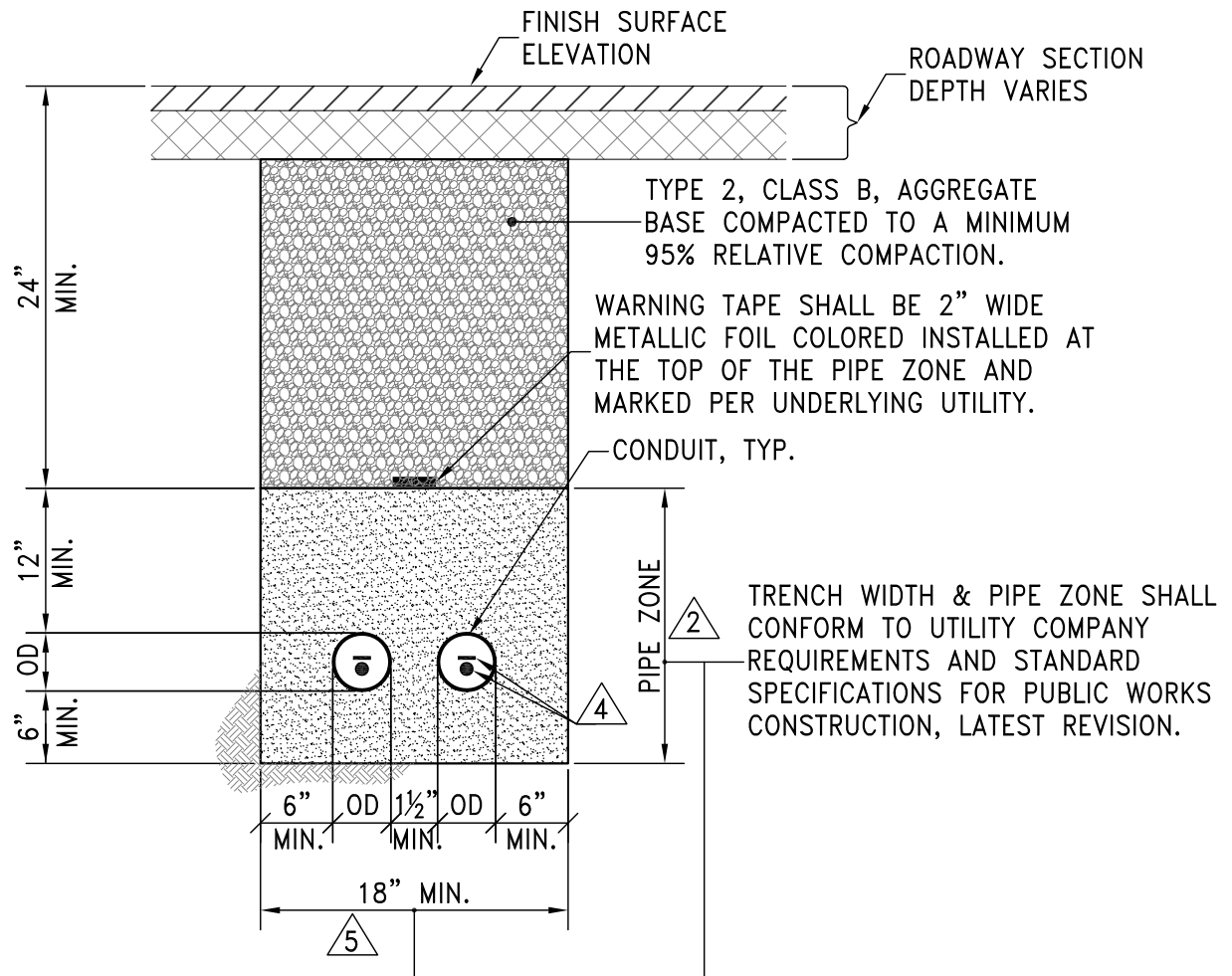
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**NOTES & SPEED BUMP  
JOINT DETAILS**

DRAWING No.

**R-403C**

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (SSPWC), LATEST REVISION.
2. BEDDING MATERIAL SHALL CONFORM TO OWNING-UTILITY COMPANY REQUIREMENTS AS APPROVED BY THE CITY OF RENO. FOR CITY OWNED TRAFFIC AND LIGHTING UTILITIES, BEDDING MATERIAL SHALL BE CLASS A. COMPACTED TO MINIMUM 90% RELATIVE COMPACTION. MATERIALS SHALL CONFORM TO SSPWC SECTION 200.
3. CEMENT SLURRY BEDDING/BACKFILL SHALL NOT BE USED.
4. INSTALL LOCATE WIRE AND MULE TAPE FOR ALL FUTURE, UNUSED, OR FIBER-OPTIC CONDUITS. LOCATE WIRE SHALL BE 12 GAGE WIRE TERMINATED AT BOX & POLYESTER PULLING TAPE SHALL BE MULE TAPE OR APPROVED EQUAL.
5. ALL EXCAVATIONS SHALL CONFORM TO THE LATEST O.S.H.A. REQUIREMENTS.



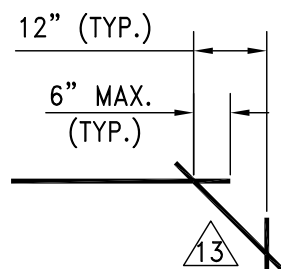
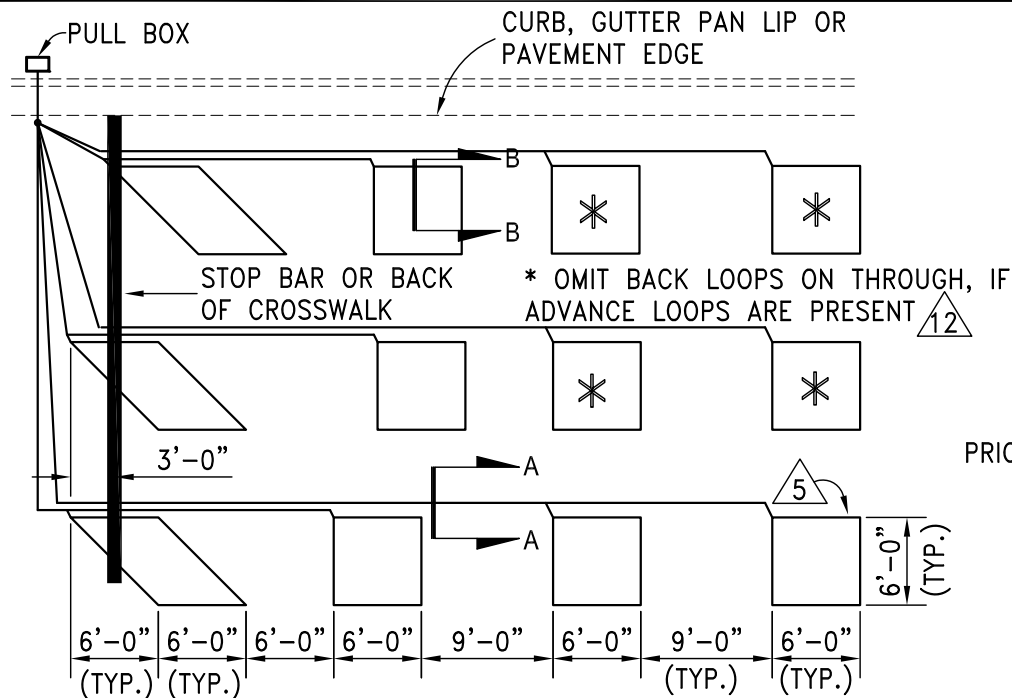
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# TRAFFIC & LIGHTING CONDUIT TRENCH

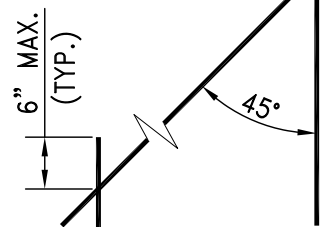
DRAWING No.

R-404

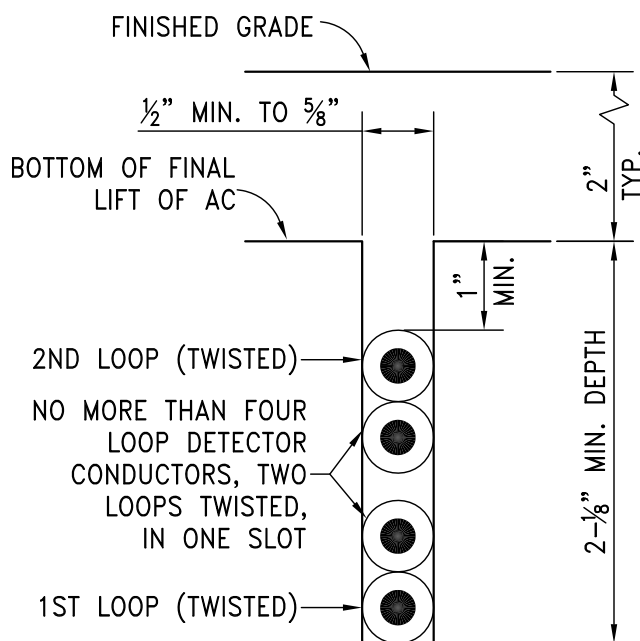
APPROVED BY: JF DATE: 1/2013



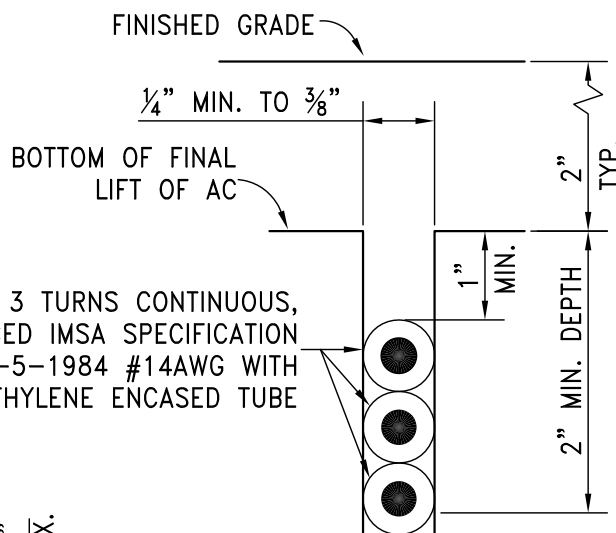
1-1/4" Ø BORE  
PRIOR TO SAW CUT



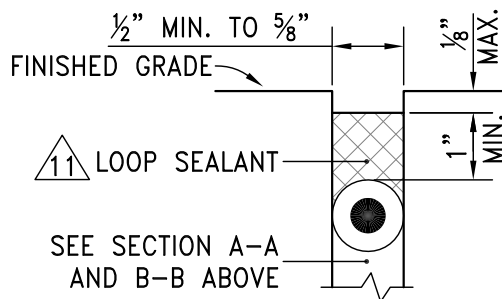
PLAN VIEW - 13  
DIAGONAL SLOT AT CORNERS  
& 1-1/4" Ø BORE



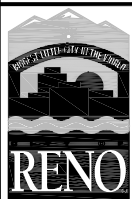
1 SECTION A-A



SECTION B-B



DETAIL A - FOR CUT IN LOOPS



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# LOOP DETECTOR LAYOUT

R-406A

APPROVED BY: JF

DATE: 8/2014

NOTES:

1. WHERE NEW PAVEMENT SURFACES ARE PLACED, ALL TRAFFIC SIGNAL LOOP DETECTORS SHALL BE INSTALLED PRIOR TO THE PLACEMENT OF THE FINAL "TOP" LIFT OF THE PLANTMIX BITUMINOUS PAVEMENT MATERIAL. PLACEMENT OF SLURRY SEAL DOES NOT NEGATE THIS REQUIREMENT.
2. SLOTS SHALL BE WASHED, BLOWN OUT AND THOROUGHLY DRIED BEFORE INSTALLING LOOP CONDUCTORS.
3. THE ADDITIONAL LENGTH OF EACH CONDUCTOR FOR EACH LOOP SHALL BE TWISTED TOGETHER INTO A PAIR (AT LEAST TWO TURNS PER FOOT) BEFORE BEING PLACED IN THE SLOT AND CONDUIT TO TERMINATION PULL BOX.
4. LOOPS SHALL BE CENTERED IN LANES.
5. LEFT TURN LOOP FARTHEST FROM FROM STOP BAR SHALL BE ON DEDICATED CHANNEL.
6. WHERE LOOPS ARE TO BE OVERLAID WITH ASPHALT, THE LOOP SEALANT SHALL BE SAKRETE, OR APPROVED EQUAL, AND COMPACTED.
7. DISTANCE BETWEEN SIDE OF LOOP AND A LEAD-IN SAW CUT FROM ADJACENT DETECTORS SHALL BE TWO FEET MINIMUM. DISTANCE BETWEEN LEAD-IN SAW CUTS SHALL BE SIX INCHES MINIMUM. DISTANCE BETWEEN LEAD-IN SAW CUTS SHALL BE TWELVE INCHES FROM ANY CURB, GUTTER PAN LIP OR PAVEMENT EDGE.
8. ALL WIRES SHALL BE IDENTIFIED IN PULL BOXES, WITH LOOP WIRES AS FOLLOWS: BLUE TAPE INDICATES LEFT TURN LANE LOOPS WITH ONE BAND IDENTIFYING LOOP ONE, TWO BANDS LOOP TWO, ETC. WHITE TAPE INDICATES THROUGH LANE LOOPS AND RED TAPE INDICATES RIGHT TURN LANES. IF THERE ARE TWO LEFT TURN LANES, YELLOW TAPE INDICATES THE LANE CLOSEST TO THE CENTER LANE OF THE STREET.
9. ALL INDUCTIVE LOOPS ON A GIVEN CHANNEL SHALL BE CONNECTED IN SERIES. NO MORE THAN ONE LEAD IN CABLE SHALL BE CONNECTED TO A CABINET CHANNEL TERMINATION. NO MORE THAN SIX INDIVIDUAL LOOPS ARE TO BE CONNECTED TO ONE CHANNEL.
10. FOR LOOP LEAD IN CABLES GREATER THAN 500 FEET, LOOP IN LENGTH SHALL BE INSTALLED WITH FOUR (4) TURNS INSTEAD OF THREE (3).
11. LOOPS CUT INTO THE STREET SURFACE SHALL BE SEALED WITH "CRAFCO" LOOP SEALANT, OR AN APPROVED EQUAL.
12. LISTED BELOW ARE THE MINIMUM DISTANCES FOR ADVANCE LOOP DETECTOR PLACEMENT AS A FUNCTION OF POSTED SPEED LIMITS, MEASURED FROM THE STOP BAR TO THE REAR OF THE LOOP. SEE TABLE BELOW.
13. 6 FOOT DIAMETER ROUND LOOPS MAY BE SUBSTITUTED AS AN APPROVED EQUIVALENT FOR PARALLELOGRAM AND/OR SQUARE LOOPS.

12	
SPEED LIMIT (MPH)	DISTANCE (FEET)
25	150
30	200
35	255
40	285
45	330
50	355
55	390



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

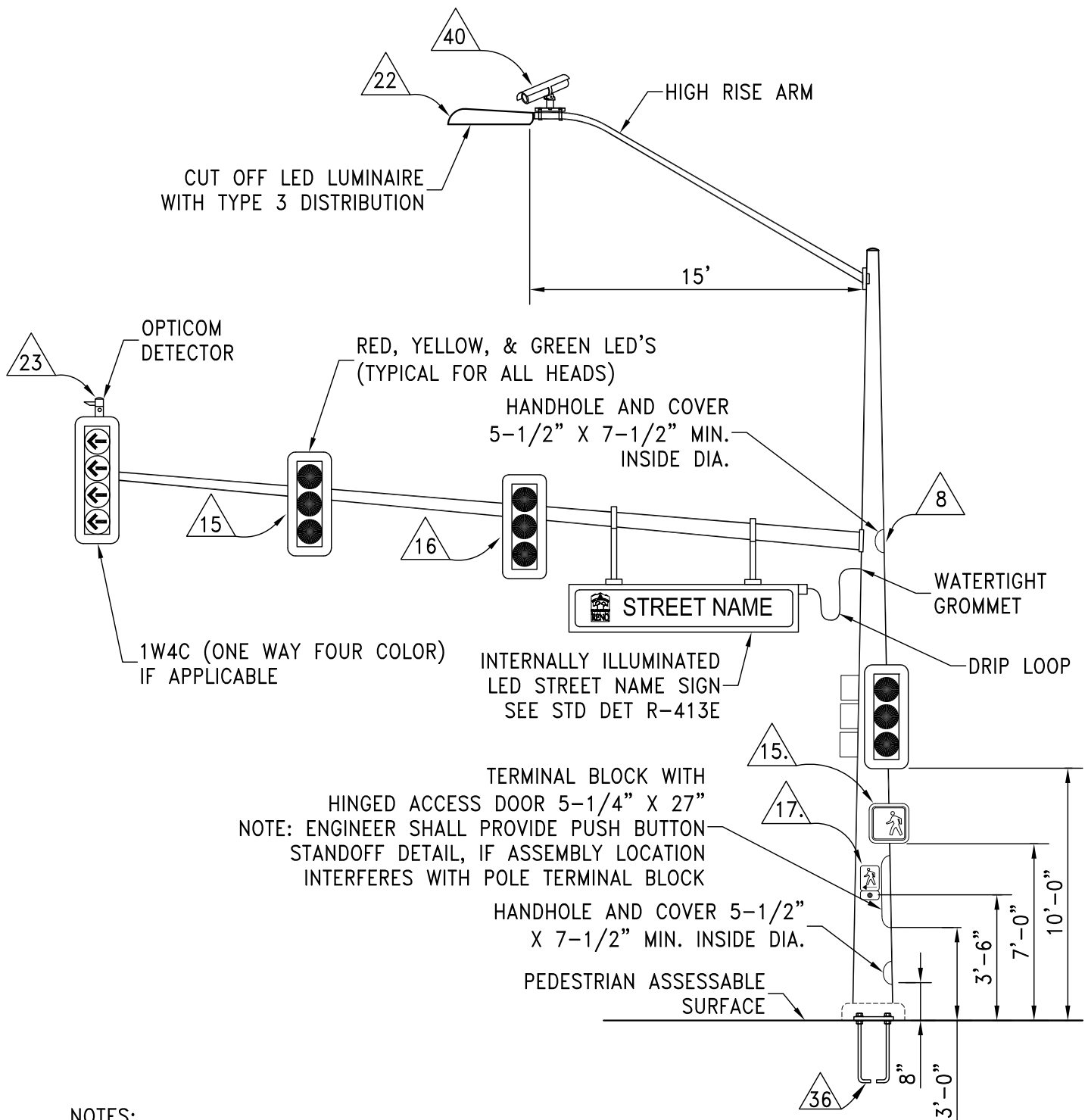
# NOTES - LOOP DETECTOR LAYOUT

DRAWING No.

R-406B

APPROVED BY: JF DATE: 8/2014





**NOTES:**

FOR ADDITIONAL DETAIL REFER TO CITY OF RENO GENERAL TRAFFIC SIGNAL NOTES.



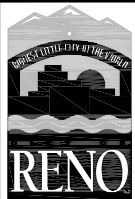
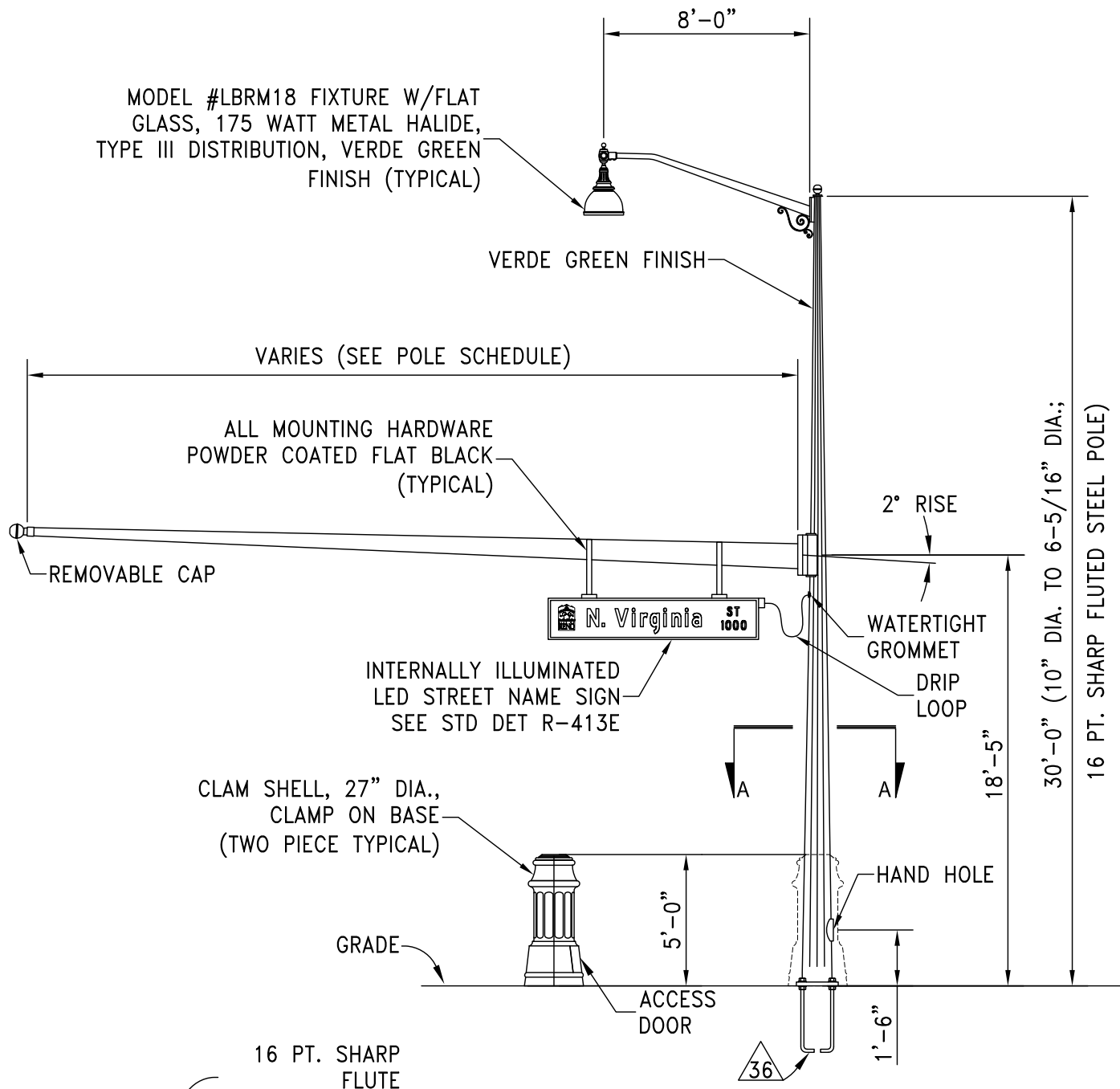
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# TRAFFIC SIGNAL POLE AND EQUIPMENT

DRAWING No.

R-413A

APPROVED BY: JF DATE: 1/2013



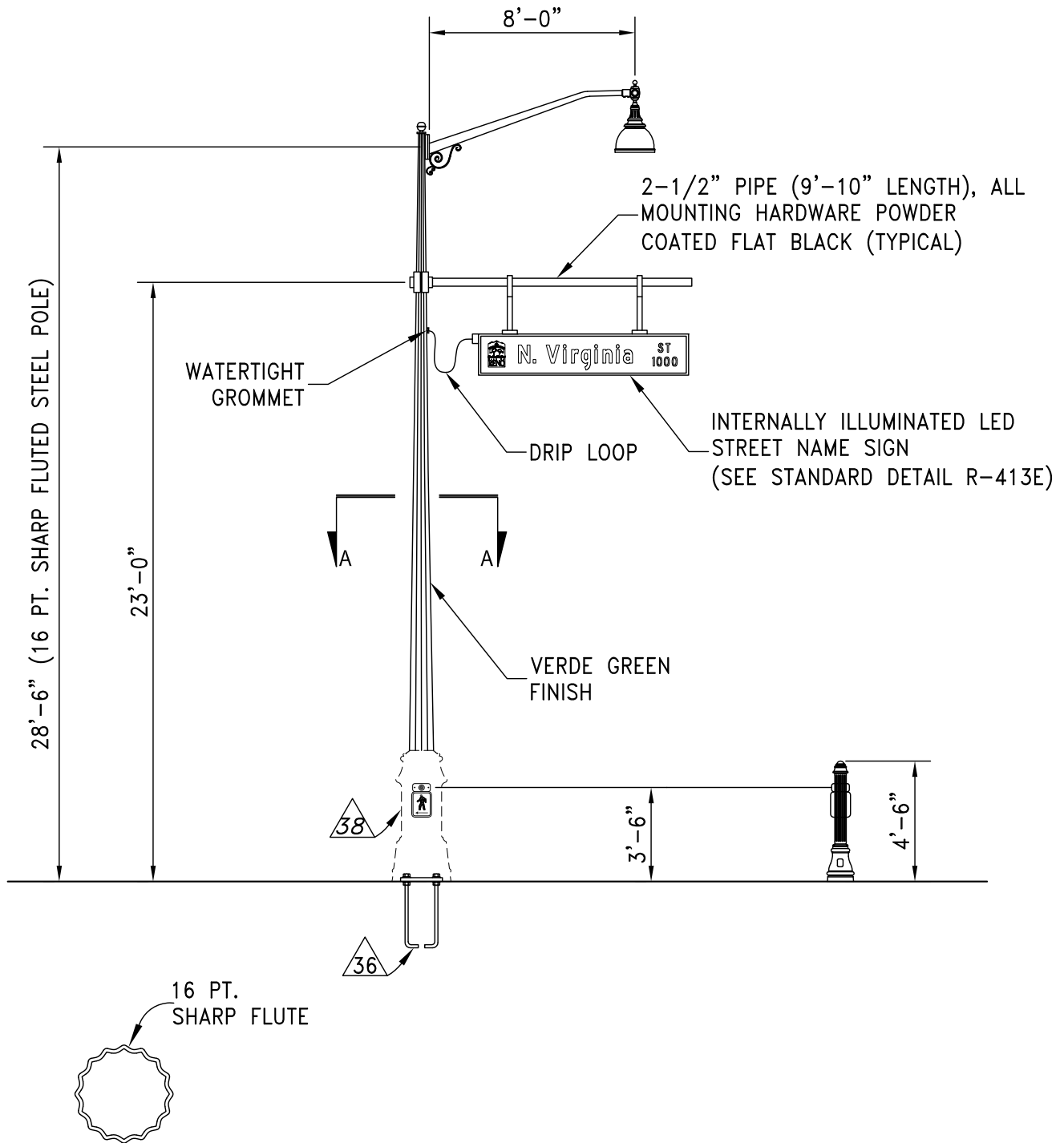
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# TRAFFIC SIGNAL DECORATIVE POLE

R-413B

APPROVED BY: JF | DATE: 1/2013



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

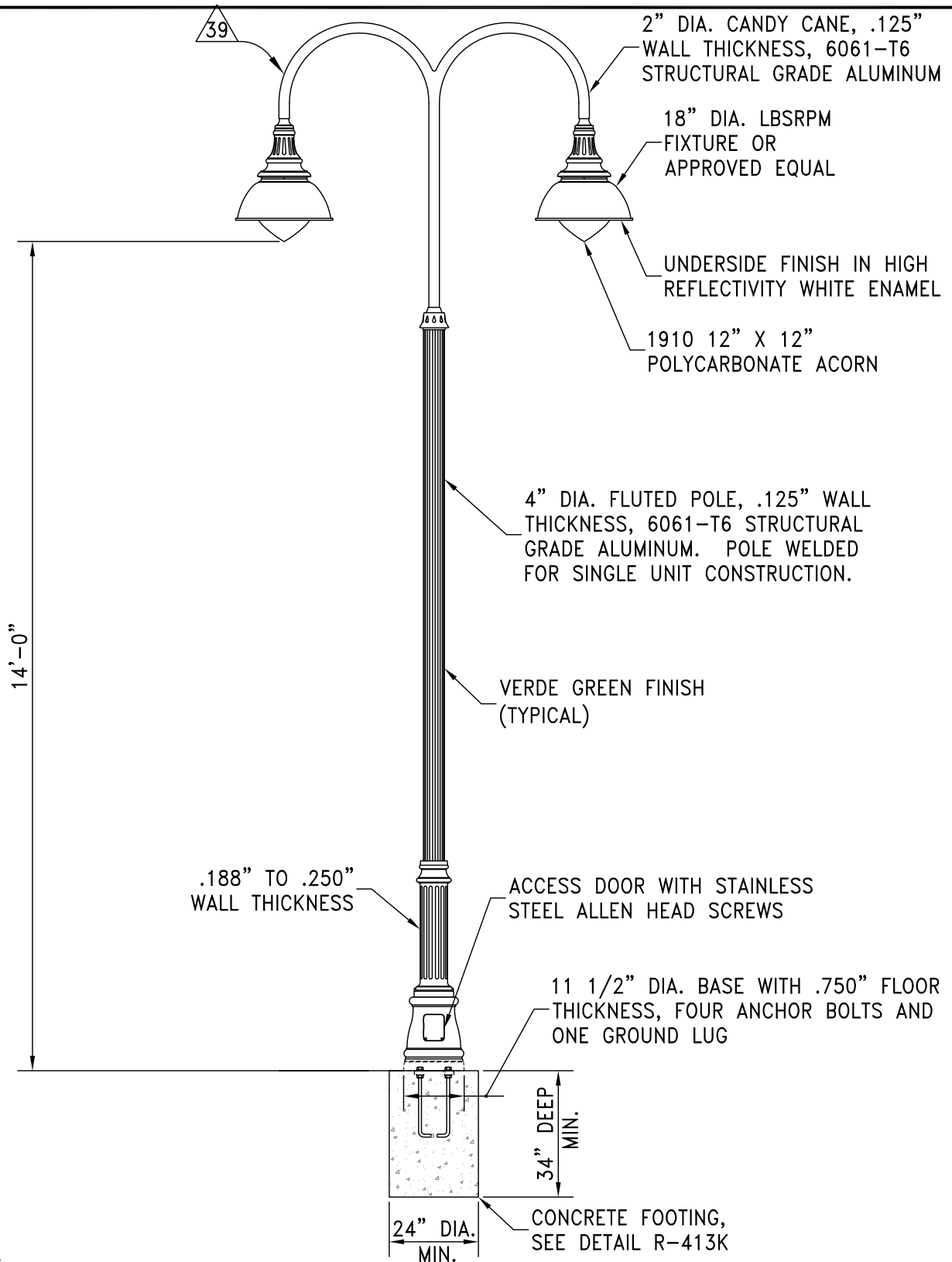
# DECORATIVE STREET LIGHT POLE

DRAWING No.

R-413C

APPROVED BY: JF DATE: 1/2013





**NOTES:**

CITY OF RENO DECORATIVE STREET LIGHT POLE IS MANUFACTURED BY "STERNBERG LIGHTING." THE MATERIAL STYLE AND COLOR OF THE POLE AND LIGHTING FIXTURES SHALL MATCH PREVIOUS PHASES OF DOWNTOWN IMPROVEMENTS TO THE SATISFACTION OF THE CITY OF RENO. PREVIOUS PHASES CONSTRUCTED IN RECENT YEARS INCLUDE ALONG VIRGINIA STREET FROM 4TH STREET TO 6TH STREET. NO EQUAL ALTERNATIVES WILL BE ALLOWED.



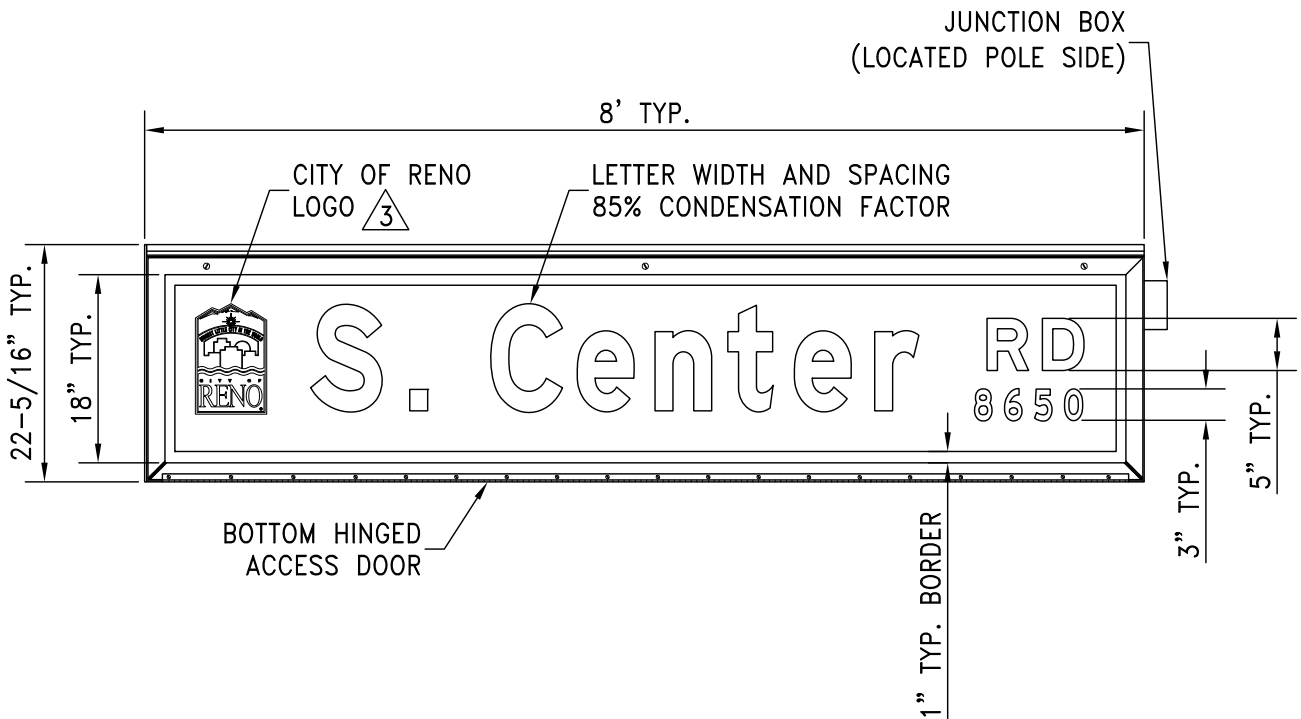
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# DECORATIVE STREET LIGHT POLE

DRAWING No.

R-413D

APPROVED BY: JF | DATE: 3/2014



**NOTES:**

1. THE CITY OF RENO LOGO AND BLOCK NUMBERS SHALL BE PRESENT ON ALL SIGN FACES. SEE IISNS SCHEDULES FOR LEGENDS. ALL STREET NAME SIGNS SHALL BE 8 FOOT DOUBLE FACED WITH CASE SENSITIVE LETTERING. CITY LOGO SHALL BE LOCATED AT THE LEFT SIDE OF THE SIGN.

2. SIGNS SHALL BE WIRED USING 16/3 SOOW OR SJOOW CABLE.

3. LOGO HEIGHT SHALL NOT EXCEED HEIGHT OF UPPERCASE LETTERING. LOGO APPLIQUES ARE NOT ALLOWED.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**POLE STREET  
NAME SIGN**

**R-413E**

APPROVED BY: JF

DATE: 3/2014

#### CITY OF RENO GENERAL TRAFFIC SIGNAL NOTES

1. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE ALL EXISTING SUBSTRUCTURES, WHETHER SHOWN OR NOT, AND TO NOTIFY ALL UTILITY COMPANIES TO VERIFY IN THE FIELD THE LOCATION OF THEIR INSTALLATIONS AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROTECT ALL SUBSTRUCTURES FROM DAMAGE, AS WELL AS ANY OTHER PUBLIC INFRASTRUCTURE. THE EXPENSE TO REPAIR OR FOR REPLACEMENT SHALL BE BORNE BY THE CONTRACTOR.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION) AND THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION), AND SUPPLEMENTED BY THE STATE OF NEVADA STANDARD PLANS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST EDITION).
3. THE LOCATION OF CONTROLLER, PULL BOXES WITH GROUND RODS, AND CONDUIT RUNS SHALL BE WITHIN THE EXISTING RIGHT-OF-WAY OR ANY EASEMENT GRANTED OUTSIDE THE RIGHT-OF-WAY.
4. DESIGN ENGINEER SHALL BE RESPONSIBLE OF THE LOCATION OF ALL ELECTRICAL, SIGNAL POLE, CONTROLLER, CONDUIT, LOOP DETECTOR, AND PULL BOXES. FINAL LOCATIONS ARE TO BE DETERMINED IN THE FIELD BY THE CONTRACTOR AND ANY CHANGES SHALL BE APPROVED BY TRAFFIC ENGINEER.
5. CONTROLLERS AND CABINETS SHALL MEET THE REQUIREMENTS OF THE NEMA STANDARD PUBLICATION (LATEST EDITION) AND THE CITY OF RENO SPECIFICATIONS FOR TRAFFIC SIGNAL CONTROLLERS AND CABINETS.
6. CONTACT THE PUBLIC WORKS TRAFFIC ENGINEERING DIVISION FOR TRAFFIC ACTUATED CONTROLLER UNIT SPECIFICATIONS.
7. UNLESS SHOWN OTHERWISE, THE CONTROLLER CABINET SHALL BE WIRED FOR EIGHT (8) PHASE OPERATION WITH TWO (2) OVERLAPS AND SHALL BE FURNISHED WITH ALL NECESSARY MODULES, LOAD SWITCHES, AND EQUIPMENT REQUIRED FOR FULL EIGHT (8) PHASE OPERATION WITH TWO (2) OVERLAPS.
8. ALL NEW SIGNAL POLES WILL HAVE TWO (2) HANDHOLES AND AN ACCESS DOOR FOR THE TERMINAL BLOCK. SEE TRAFFIC SIGNAL POLE DETAIL DRAWING R-413A FOR TRAFFIC SIGNAL EQUIPMENT DIMENSIONS. FOR OTHER POLE DETAILS, SEE THE NEVADA DEPARTMENT OF TRANSPORTATION'S "STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION" (NDOT-SPRBC), LATEST EDITION.
9. UNLESS SHOWN OTHERWISE, No. 5 PULL BOX SHALL BE USED AT LOCATIONS WHERE CONDUIT RUNS CONTAIN TRAFFIC SIGNAL CABLE OR CARRY POWER. No. 3-1/2 SHALL ONLY BE USED AS APPROVED BY CITY OF RENO TRAFFIC ENGINEER. TRAFFIC RATED BOX SHALL BE USED IN VEHICULAR AREAS ONLY, INCLUDING, BUT NOT LIMITED TO TRAVEL WAY, DRIVEWAY APPROACHES AND WITHIN PEDESTRIAN RAMPS AT INTERSECTION CURB RETURNS. ALL PULL BOXES WITH METAL LIDS SHALL BE GROUNDED PER TRAFFIC RATED PULL BOX DETAIL.
10. ALL EXPOSED CONDUIT SHALL BE OF A RIGID PVC SCHEDULE 80 AND SHALL EXTEND TO A MINIMUM DEPTH OF 18 INCHES.
11. ALL CONDUIT RUNS FOR SIGNAL CABLE SHALL CONSIST OF TWO 3" CONDUITS BETWEEN PULL BOXES AND BETWEEN THE PULL BOXES AND POLES. THERE SHALL BE THREE 3" CONDUITS FROM THE CONTROLLER CABINET TO THE PULL BOXES.
12. ALL CONDUIT RUNS TERMINATING IN A PULL BOX SHALL HAVE A MINIMUM OF SIX INCHES OF CLEARANCE FROM THE BOTTOM OF THE LID, AND SHALL RISE A MINIMUM OF THREE INCHES ABOVE THE TOP OF THE DRAIN ROCK.
13. ALL NEW CONDUIT RUNS SHALL HAVE A PULL TAPE.
14. ALL CONDUIT TERMINATIONS SHALL HAVE A "BELL END" INSTALLATION AND BE SEALED WITH CONDUIT SEALER AFTER WIRE INSTALLATION. CONDUIT ENDS SHALL NOT TERMINATE WITHIN A SWEEP SECTION. ALL CONDUCTORS AND THEIR TERMINATION SHALL BE CLEARLY MARKED ON THE CABINET SCHEMATIC WIRING DIAGRAM.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

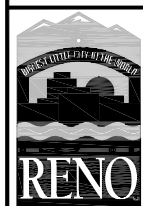
## NOTES - TRAFFIC SIGNALS & POLES

R-413F

APPROVED BY: JF

DATE: 1/2013

15. THE RED, YELLOW AND GREEN INDICATION FOR ALL NEW VEHICULAR SIGNAL HEADS SHALL BE 12 INCH LIGHT EMITTING DIODE (LED) AND INCLUDE "AlInGaP" TECHNOLOGY. UTILIZE "GELCORE" RX11, "DIALITE" 433 SERIES OR APPROVED EQUAL. ALL PEDESTRIAN SIGNAL INDICATIONS SHALL BE COUNTDOWN "LED" WITH HAND SYMBOL (PORTLAND ORANGE) AND WALKING MAN SYMBOL (LUNAR WHITE).
16. ALL VEHICULAR HEADS SHALL HAVE "TUNNEL" VISORS WITH 4 INCH SLOT AT BOTTOM WITH LOUVERED BACK PLATES. ALL SIGNAL HEADS TO BE MANUFACTURED BY "ECONOLITE", "EAGLE" OR APPROVED EQUAL. IF DIRECTED BY THE ENGINEER, EXTRA BACK PLATES TO BE PROVIDED FOR STOCK.
17. ALL NEW PEDESTRIAN PUSH BUTTONS SHALL BE THE 2 INCH DIAMETER WITH INTERNATIONAL WALKING MAN SYMBOL SIGN. FOR MOUNTING HEIGHT AND ADDITIONAL DETAILS, SEE STANDARD PLAN SHEET NO. T-30.1.3.1 OF NDOT-SPRBC. UTILIZE "Palara" BULLDOG W/MOMENTARY "LED" AND YELLOW COLLAR, OR APPROVED EQUAL. USE 5" X 7-3/4" STATION FOR 1A POLES AND SMALLER.
18. ALL INTERSECTIONS SHALL HAVE A BATTERY BACK UP SYSTEM. THE SYSTEM SHALL BE MOUNTED TO THE METERED SERVICE CABINET OF THE SYSTEM AND WILL BE A 24 VOLT OR 48 VOLT SYSTEM. THE CABINET SHALL BEAR A 508 UL LABEL. THE SYSTEM SHALL SUPPLY A MINIMUM UNINTERRUPTED CONTINUOUS POWER SUPPLY (UPS) SERVICE FOR UP TO 2 HOURS. THE SYSTEM SHALL FEATURE AN EVENT COUNTER AND TIMER. THE SYSTEM SHALL HAVE A TWO (2) YEAR PARTS AND LABOR TRANSFERABLE WARRANTY TO THE CITY OF RENO. THE UPS UNIT AND THE METERED PEDESTAL SHALL BE DESIGNED AS ONE COMPLETE UNIT. THE UPS SYSTEM SHALL BE A PIGGYBACK DESIGN SYSTEM AND HANG ON THE METERED SERVICE PEDESTAL.
19. WHEN CONTROLLER CABINETS ARE NOT LOCATED IN A SIDEWALK, THEY SHALL HAVE A CONCRETE SERVICE PAD INSTALLED IN FRONT OF THE CABINET, THE SAME WIDTH AS CABINET AND AT LEAST 3 FEET LONG. NO IMPROVEMENTS SHALL BE PERMITTED TO BLOCK CABINET DOOR IN COMPLIANCE WITH NEC. SPRINKLER SYSTEMS SHALL BE DIRECTED AWAY FROM AND NOT ALLOWED TO SPRAY CABINET OR PULL BOXES DIRECTLY.
20. ALL NEW TRAFFIC SIGNALS SHALL BE CONNECTED INTO THE CITY OF RENO'S TRAFFIC SIGNAL CENTRAL COMPUTER SYSTEM VIA THE NEAREST RECEIVER SITE BY FIBER-OPTIC OR AN APPROVED OTHER.
21. FOR FIBER OPTIC AND EQUIPMENT CONTACT CITY OF RENO TRAFFIC ENGINEERING FOR LATEST SPECIFICATIONS.
22. THE LUMINAIRE FIXTURES SHALL BE 120 VOLT, 250 WATT EQUIVALENT LED, 180 DEGREE CUTOFF WITH FLAT GLASS, TYPE III DISTRIBUTION WITH AUTO/REG BALLAST AND INTEGRAL CONTROLS. PHOTO CELL TO BE LOCATED IN METERED SERVICE PEDESTAL.
23. PREEMPTION OF SIGNALS BY EMERGENCY VEHICLES SHALL BE PROVIDED BY INSTALLING MODEL 762 PHASE SECTOR DETECTORS WITH THE MODEL 752N PHASE SELECTOR, OR AN APPROVED EQUAL.
24. LOOP DETECTORS SHALL BE INSTALLED IN ACCORDANCE WITH THE CITY OF RENO SUPPLEMENTAL STANDARD DRAWING DETAILS FOR PUBLIC WORKS CONSTRUCTION.
25. THE CONTRACTOR SHALL PROVIDE AN UNDERGROUND SERVICE PEDESTAL. THE MAIN BREAKER SHALL BE 100 AMP MINIMUM (120/240 VAC, 60 HZ, SINGLE PHASE, 3 WIRE) IN ACCORDANCE WITH NDOT STANDARD PLAN T-30.1.6. INDIVIDUAL CIRCUIT BREAKERS SHALL INCLUDE 120 VOLT: 30 AMP 1-POLE CIRCUIT BREAKER FOR SIGNAL; 30 AMP 2-POLE CIRCUIT BREAKER FOR LIGHTING CONTACTOR; 20 AMP 1-POLE CIRCUIT BREAKER FOR STREET LIGHTS; 20 AMP 1-POLE CIRCUIT BREAKER FOR SIGNS; 15 AMP 1-POLE CIRCUIT BREAKER FOR CONTROL; AND A 15 AMP 1-POLE CIRCUIT BREAKER FOR GFI RECEPTACLE. THE CONDUCTOR TO THE CABINET FROM THE BREAKER SHALL BE A MINIMUM OF 10 GAUGE WIRE.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# NOTES - TRAFFIC SIGNALS & POLES

R-413G

APPROVED BY: JF | DATE: 1/2013

26. THE CONTRACTOR SHALL COORDINATE WITH NV ENERGY IN PROVIDING SERVICE FOR THE SIGNAL WITHIN NV ENERGY STANDARDS.
27. POWER PANEL SURGE PROTECTION SHALL BE PROVIDED AND APPROVED THROUGH THE SUBMITTAL PROCESS TO THE PUBLIC WORKS TRAFFIC ENGINEERING DIVISION.
28. EXISTING VEHICLE DETECTOR LOOPS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AND MADE FULLY FUNCTIONAL WITHIN TWO WORKING DAYS. IF NOT MADE FUNCTIONAL WITHIN THE TWO DAYS FOLLOWING DAMAGE, THE CITY MAY PERFORM THE REPAIR AND BACK-CHARGE THE CONTRACTOR AT THE EXPENSE OF \$1000 PER LOOP. SPLICING WILL NOT BE CONSIDERED AS AN ADEQUATE REPAIR.
29. THE CONTRACTOR SHALL COORDINATE TRAFFIC SIGNAL INSTALLATIONS OR MODIFICATIONS WITH THE CITY OF RENO TRAFFIC ENGINEER AT 334-2243.
30. NO SPLICES SHALL BE PERMITTED BETWEEN THE CONTROLLER CABINET AND THE TRAFFIC SIGNAL POLE. ALL CONNECTIONS SHALL BE MADE AT THE JUNCTION BOX, OR IN THE CASE OF LOOPS, AT THE LOOP STUB. ANY DEVIATION TO THIS REQUIREMENT SHALL BE APPROVED BY THE TRAFFIC ENGINEER PRIOR TO THE WORK.
31. VEHICLE DETECTOR LOOPS DAMAGED DURING CONSTRUCTION WHICH ARE PERMITTED BY THE TRAFFIC ENGINEER TO BE TEMPORARILY SPLICED, MUST BE REPLACED PRIOR TO FINAL ACCEPTANCE.
32. IF ANY PAVEMENTS MARKINGS ARE TO BE RELOCATED, VEHICLE DETECTOR LOOPS SHALL BE RELOCATED ACCORDINGLY TO REMAIN CONSISTENT WITH CITY OF RENO STANDARD DETAIL NO. R-406A AND NO. R-406B.
33. AS A PART OF ANY STREET WIDENING PROJECT OR THE ADDITION OF ANY STREET TRAVEL LANES TO EXISTING LANES, SUCH AS TURN LANES, ACCELERATION OR DECELERATION LANES, ETC., THE CONTRACTOR MUST EXTEND ANY TRAFFIC CONTROL CONDUITS AND/OR WIRING AND REPLACE ALL AFFECTED VEHICLE LOOP DETECTOR WIRING (SPLICING SHALL NOT BE ALLOWED).
34. SIGNAL EQUIPMENT SHALL BE PROVIDED AND APPROVED THROUGH THE SUBMITTAL PROCESS TO THE PUBLIC WORKS TRAFFIC ENGINEERING DIVISION.
35. FOR POLE DETAILS NOT SHOWN, SEE POLE MANUFACTURER'S DETAILED DRAWINGS.
36. ALL SIGNAL POLES SHALL CONFORM TO NDOT TYPE 35 AND 35A SPECIFICATIONS, INCLUDING BOLT CIRCLE DIMENSIONS, ANCHOR BOLTS, AND FOOTING DIMENSIONS.
37. FINAL POLE APPROVAL AND SUBMITTALS TO BE APPROVED BY THE CITY OF RENO.
38. CLAM SHELL FOR TYPE 7D POLE TO BE USED ONLY WHEN POLE IS INCLUDED AS A SIGNAL POLE. DO NOT USE CLAM SHELL WHEN TYPE 7D POLE IS USED IN SERIES LIGHTING.
39. POLE MAY BE MANUFACTURED AS EITHER A DOUBLE OF SINGLE CANDYCANES CONFIGURATION.
40. VIDEO DETECTION MAY BE USED IF APPROVED BY THE CITY TRAFFIC ENGINEER.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

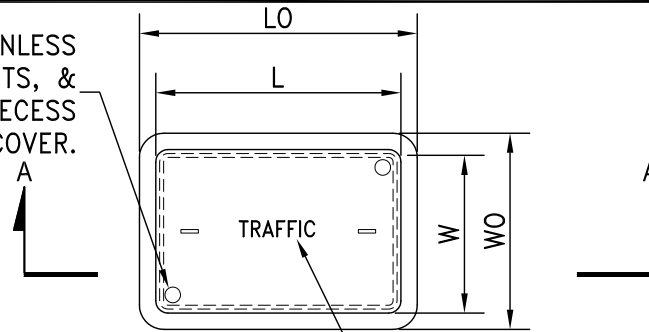
DRAWING No.

# NOTES - TRAFFIC SIGNALS & POLES

R-413H

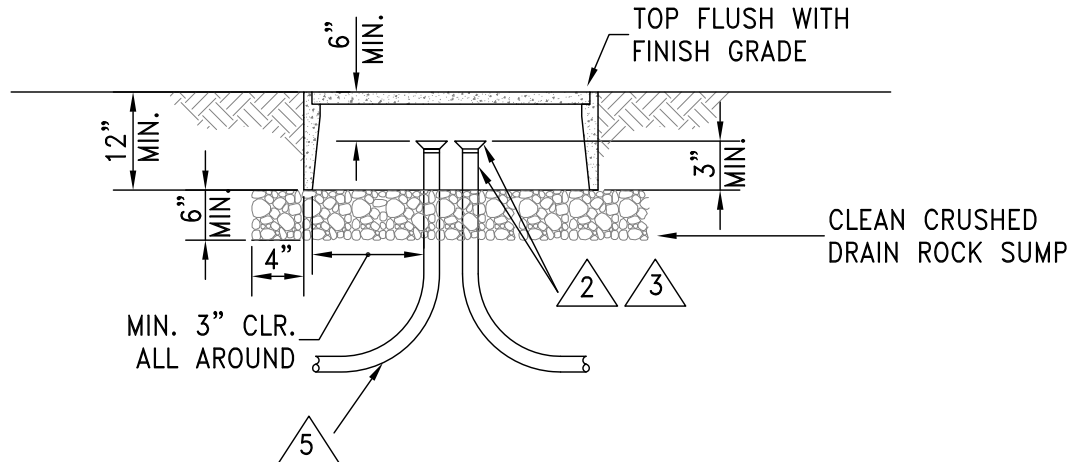
APPROVED BY: JF | DATE: 1/2013

3/8" DIA BRASS OR STAINLESS  
STEEL STUD BOLTS, NUTS, &  
WASHERS-2 PER BOX. RECESS  
BOLT IN COVER.



**PLAN**

RAISED INSCRIPTION LETTER HEIGHT  
TO BE 1" MIN. TO 3" MAX WITH  
WORDS "TRAFFIC" OR "LIGHTING"



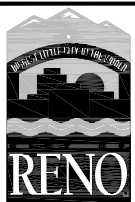
**SECTION A-A**

**PULL BOX MINIMUM DIMENSION TABLE**

PULL BOX	CONCRETE BOX		COVER (PCC ONLY)	
	LO	WO	L	W
No. 3-1/2	20"	14"	15-3/8"	10-1/4"
No. 5	28"	18"	23-1/4"	13-3/4"

**NOTES:**

1. No. 5 PULL BOX SHALL BE USED AT LOCATION WHERE CONDUIT RUNS CONTAIN TRAFFIC SIGNAL CABLE OR CARRY POWER. No. 3-1/2 SHALL ONLY BE USED AS APPROVED BY CITY OF RENO TRAFFIC ENGINEER.
2. ALL CONDUIT TERMINATIONS SHALL HAVE A "BELL END" INSTALLATION AND BE SEALED WITH CONDUIT SEALER AFTER WIRE INSTALLATION.
3. ALL EXPOSED CONDUIT SHALL BE RIGID PVC SCHEDULE 80, AND SHALL EXTEND TO A MINIMUM DEPTH OF 18 INCHES.
4. BOX EXTENSIONS SHALL NOT BE USED UNLESS APPROVED BY CITY OF RENO TRAFFIC ENGINEER.
5. CONDUIT ENDS SHALL NOT TERMINATE WITHIN A SWEEP SECTION.



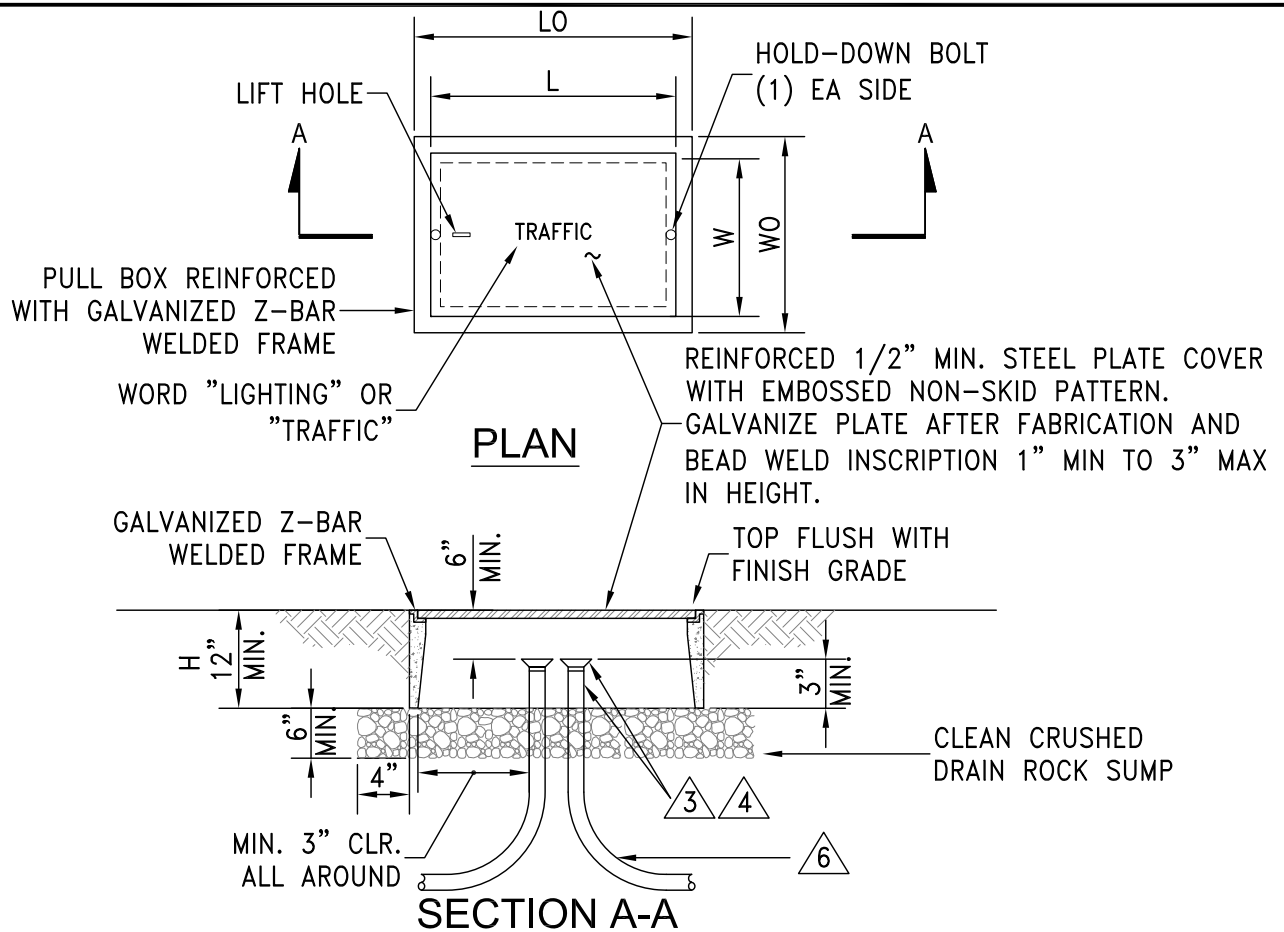
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**STANDARD PULL BOX**

DRAWING No.

**R-413I**

APPROVED BY: JF | DATE: 1/2013



TRAFFIC RATED PULL BOX MINIMUM DIMENSION TABLE					
PULL BOX	CONCRETE BOX		COVER (STEEL COVER)		HEIGHT
	LO	WO	L	W	
No. 3-1/2	19"	12"	14-1/2"	8-3/4"	12"
No. 5	25"	15"	20-1/2"	10-1/2"	12"
No. 7	35"	22"	30"	17"	12"
No. 9	52"	35"	47-3/4"	30"	14"

**NOTES:**

- No. 5 TRAFFIC RATED PULL BOXES SHALL BE USED AT LOCATION WHERE CONDUIT RUNS CONTAIN TRAFFIC SIGNAL CABLE OR CARRY POWER. No. 3-1/2 TRAFFIC RATED PULL BOXES SHALL ONLY BE USED AS APPROVED BY CITY OF RENO TRAFFIC ENGINEER.
- TRAFFIC RATED BOX SHALL BE USED IN VEHICULAR AREAS ONLY, INCLUDING, BUT NOT LIMITED TO TRAVEL WAY, DRIVEWAY APPROACHES AND WITHIN PEDESTRIAN RAMPS AT INTERSECTION CURB RETURNS OR AS APPROVED BY CITY OF RENO TRAFFIC ENGINEER.
- ALL CONDUIT TERMINATIONS SHALL HAVE A "BELL END" INSTALLATION AND BE SEALED WITH CONDUIT SEALER AFTER WIRE INSTALLATION.
- ALL EXPOSED CONDUIT SHALL BE RIGID PVC SCHEDULE 80, AND SHALL EXTEND TO A MINIMUM DEPTH OF 18 INCHES.
- BOX EXTENSIONS SHALL NOT BE USED UNLESS APPROVED BY CITY OF RENO TRAFFIC ENGINEER.
- CONDUIT ENDS SHALL NOT TERMINATE WITHIN A SWEEP SECTION.
- ALL METAL COVERS, METAL Z-BAR FRAME, METAL RINGS OR ANY METALLIC COMPONENT OF A PULL BOX SHALL BE BONDED TO A #8 AWG OR LARGER COPPER EQUIPMENT GROUNDING CONDUCTOR. BONDING JUMPERS SHALL BE BRAIDED COPPER EQUIVALENT TO #8 AWG COPPER AND MINIMUM 36" IN LENGTH AND SHALL BE ATTACHED WITH EXOTHERMIC WELDING. PROCESS IS A MOLECULAR BONDING WITH HIGH COPPER CONTENT ALLOYS (IN EXCESS OF 90%), HIGH CORROSION RESISTANCE AND HIGH CONDUCTIVITY, AND APPROVED GROUNDING LUG.



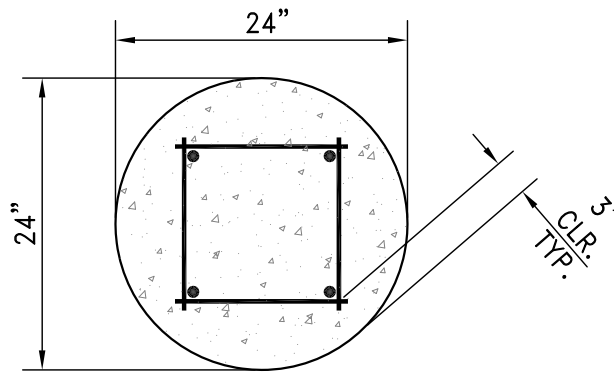
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

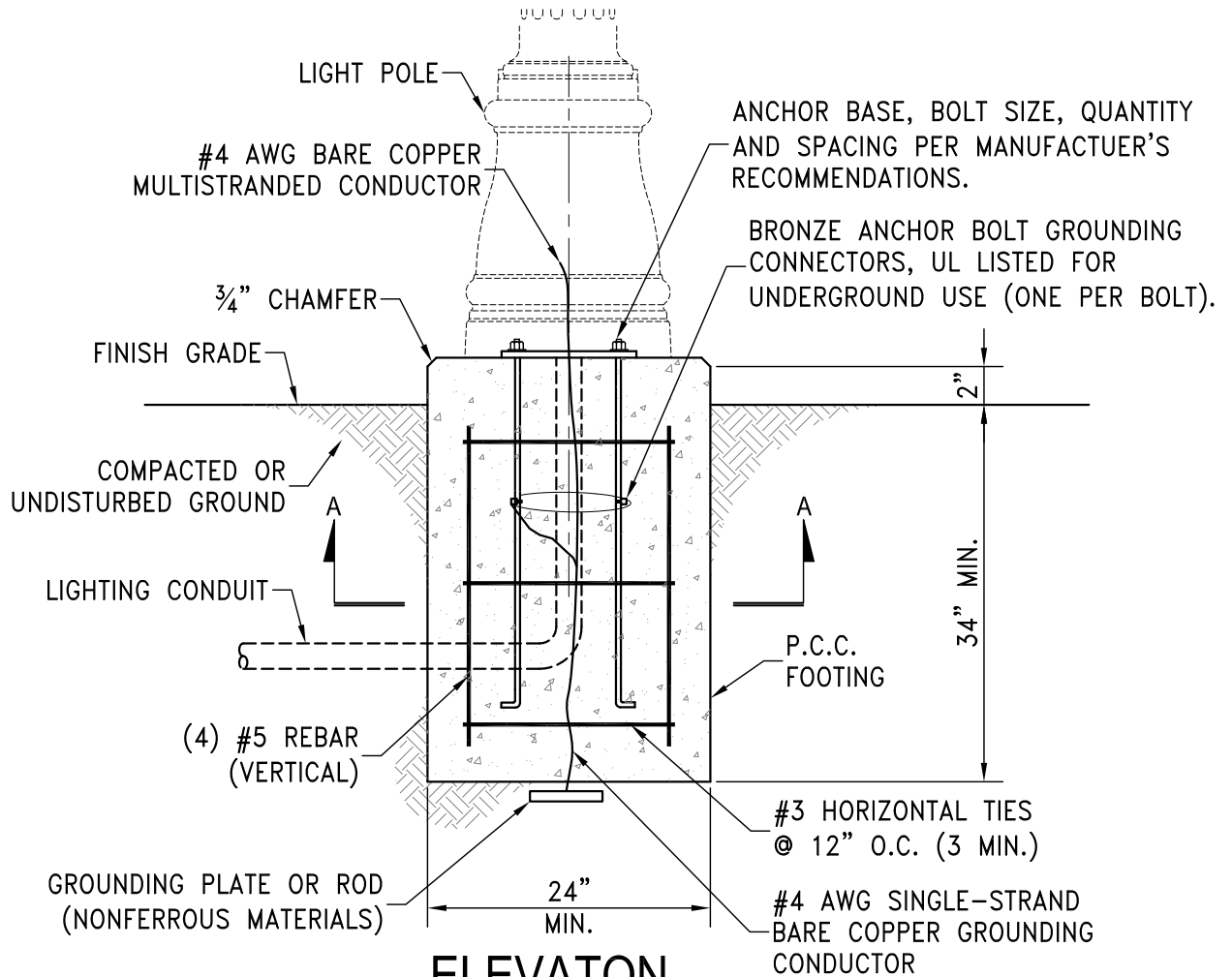
**TRAFFIC RATED PULL BOX**

**R-413J**

APPROVED BY: JF | DATE: 1/2013



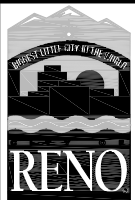
**SECTION A-A**



**ELEVATION**

**NOTES:**

1. FIBER-REINFORCED PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 4000 PSI MIN. COMPRESSIVE STRENGTH AT 28 DAYS, MIN. 6 SACKS OF CEMENT PER CUBIC YARD WITH MAX. WATER-CEMENT RATIO OF 0.45, AIR ENTRAINMENT 6%  $\pm$  1.5%, SLUMP AT 1 TO 4 INCHES. MIX DESIGN SHALL CONFORM TO THE REQUIREMENTS OF SECTION 337 OF STANDARD SPECIFICATIONS OF PUBLIC WORKS CONSTRUCTION (SSPWC). CEMENT SHALL BE TYPE II. ALL CEMENT CONCRETE SHALL HAVE A COARSE AGGREGATE GRADATION CONFORMING TO SIZE No. 67. POLYPROPYLENE OR CELLULOSE FIBERS SHALL BE ADDED TO THE P.C.C. AT 1.5 LBS. PER CUBIC YARD. ALL MATERIALS SHALL CONFORM TO SSPWC.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**LIGHT POLE FOOTING**

DRAWING No.

**R-413K**

APPROVED BY: JF

DATE: 1/2013

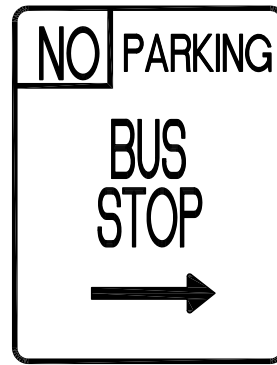




R7-107  
12"x18"



R7-107  
12"x18"



R7-107  
12"x18"




R7-8  
12"x18"




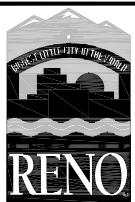
R7-9a  
12"x18"



R7-108  
12"x18" 

NOTES:

1. SIGN LETTERS, COLORS AND PLACEMENT SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
-  TIME RESTRICTED PARKING SIGNS ARE AVAILABLE IN 30 MINUTE, 1 HOUR, 2 HOUR, AND 5 HOUR INCREMENTS.
3. REFER TO STANDARD DETAIL DRAWING NO. R-415 FOR MOUNTING AND POLE REQUIREMENTS, UNLESS OTHERWISE SPECIFIED.



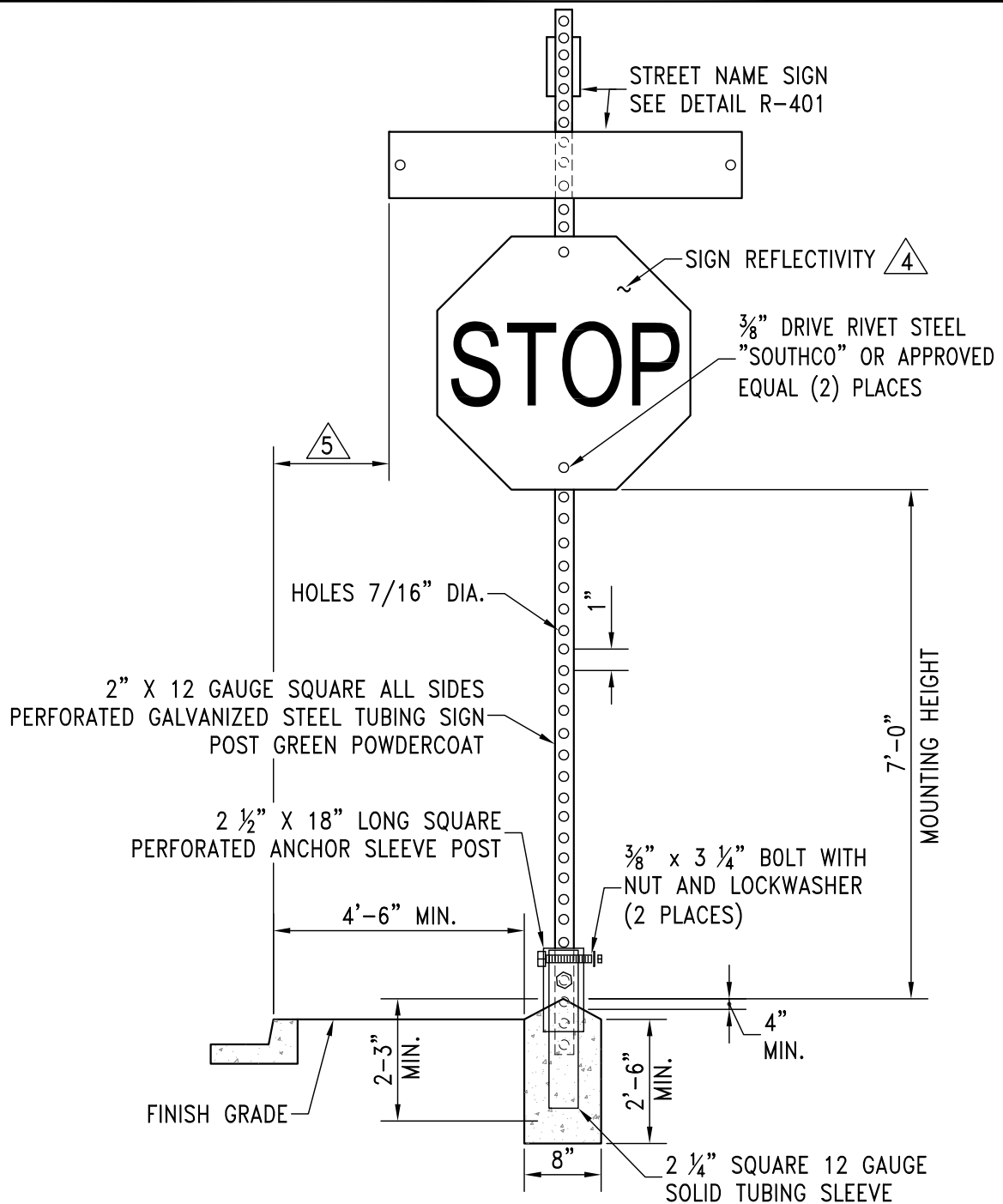
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# TRAFFIC PARKING SIGNS

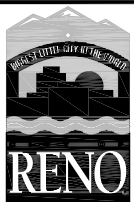
R-414

APPROVED BY: JF | DATE: 1/2013



**NOTES:**

1. SIGN MATERIALS, CONSTRUCTION AND PLACEMENT SHALL BE IN CONFORMANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
2. ON STREETS WHERE CURBING DOES NOT EXIST, SET SIGN 6' MINIMUM FROM PAVEMENT EDGE.
3. CONCRETE BASE SHALL BE LOCATED AT BACK OF SIDEWALK, UNLESS OTHERWISE DIRECTED BY THE CITY ENGINEER.
- $\triangle 4$ . ALL REGULATORY SIGNS SHALL BE 3M DIAMOND GRADE (DG3) WITH A 3M CLEAR TRANSPARENT OVERLAY #1170 OR APPROVED EQUAL.
- $\triangle 5$ . 2 FOOT MINIMUM FROM EDGE OF SIGN TO FACE OF CURB IN RESIDENTIAL, COMMERCIAL OR BUSINESS AREAS.



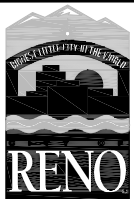
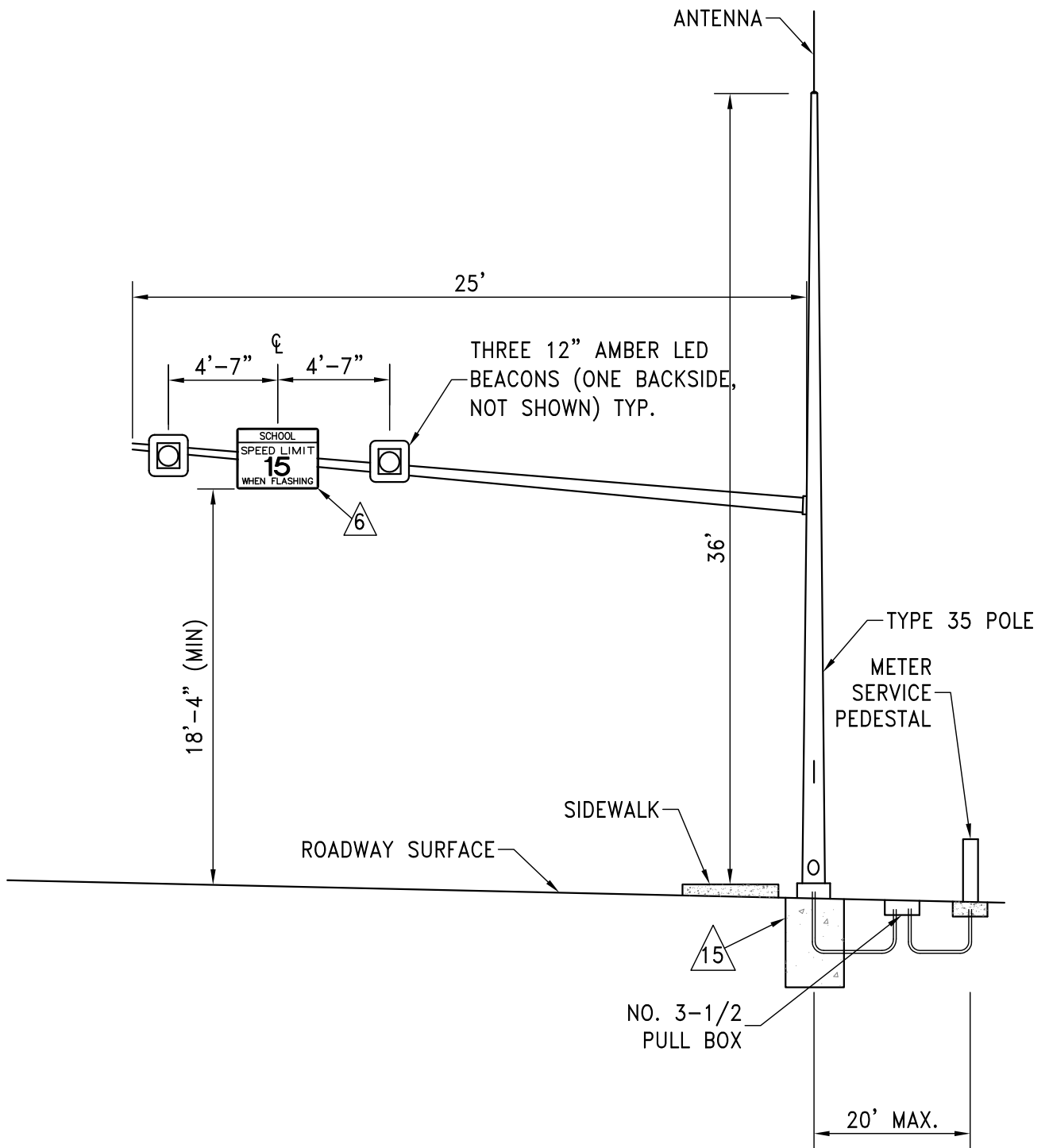
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# TRAFFIC SIGN INSTALLATION

DRAWING No.

R-415

APPROVED BY: JF DATE: 1/2013



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

# SCHOOL ZONE FLASHERS

R-417A

APPROVED BY: JF | DATE: 1/2013

NOTES:

1. YELLOW POLYCARBONATE SINGLE HEADS.
2. ALL PIPING SHALL BE YELLOW IN ALUMINUM OR BRASS, INCLUDING END OF MAST RIGID FITTING.
3. YELLOW FULL CIRCLE VISORS POLYCARBONATE.
4. SINGLE HEAD BACKPLATES FOR ALL HEADS TO BE 1 PIECE, BLACK POLYCARBONATE.
5. HEADS EITHER TENON MOUNT OR END OF MAST 2 WAY CROSS TOP HUNG.
- △ 6. ALL SIGNS SHALL COMPLY WITH THE MUTCD.
7. SIGN FOR MAST ARM SHALL BE MIN. 30" X 24" ATTACHED TO ARM WITH BRACKETS.
8. SIGN FOR POLE MOUNT SHALL BE MINIMUM 48" X 24" MOUNTED DIRECTLY TO POLE USING 4 BOLTS AND 1 BRACKET.
9. SIGN FOR MAST ARM "END OF ZONE" SHALL BE 12" X 24" AND MOUNTED DIRECTLY BEHIND MAST ARM "SCHOOL ZONE" SIGN WITH BRACKET.
10. ALTERNATING FLASH CAN BE EITHER SOLID STATE #159 2 CIRCUIT, 4 PIN-2.88"X2.75"X2.56" OR NEMA TYPE 6 PIN FLASHER SOCKET MOUNTED HORIZONTAL WITH THE FLASHER STANDING ON THE SOCKET.
11. RTC MFG MODEL NO. CPR2102R, OR APPROVED EQUAL, SHALL BE USED UNLESS OTHERWISE SPECIFIED BY THE CITY OF RENO.
12. YELLOW LED'S SHALL BE THE CURRENT CITY OF RENO SPECIFICATION.
13. SERVICE TO BE A TYPE 3R TESCO 26-100 OR BETTER WITH BRUSHED ALUMINUM FINISH, RTC MFG MODEL NO. CPR2102R, OR APPROVED EQUAL, TO BE MOUNTED AT TOP OF THE POWER DISTRIBUTION PANEL.
14. ALL EQUIPMENT SHALL BE WITHIN THE CITY OF RENO RIGHT-OF-WAY OR EASEMENT WITH POLE LOCATED BEHIND SIDEWALK.
- △ 15. SEE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION (ORANGE BOOK) FOR POLE BASE AND POLE DETAILS.
16. MAST ARMS MAY BE DELETED FOR ONE-LANE EACH DIRECTION ROADWAYS.
17. SOLAR EQUIPMENT SHALL NOT BE CONSIDERED UNLESS POWER SOURCE IS GREATER THAN ONE MILE.
18. TESTED AND PROVEN OPERATIONAL BEFORE CITY ACCEPTANCE.
19. MAXIMUM DISTANCE FROM ANTENNA TO CLOCK LOCATION 60'. (36'+20'=56'≈60')



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

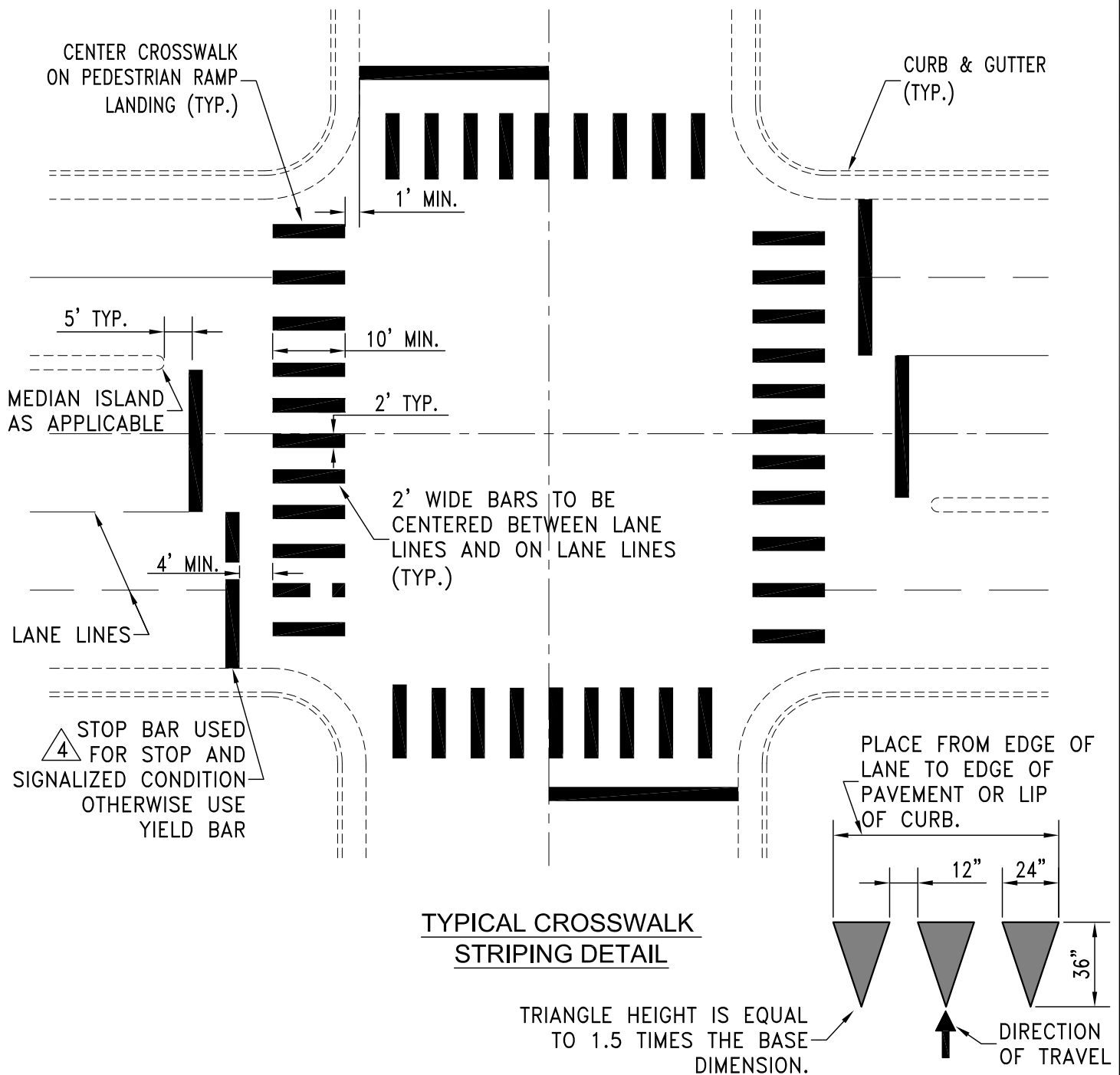
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**NOTES -  
SCHOOL ZONE FLASHERS**

**R-417B**

APPROVED BY: JF | DATE:1/2013





**TYPICAL CROSSWALK  
STRIPING DETAIL**

**YIELD BAR MARKINGS**

**NOTES:**

1. ALL STRIPING SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS, LATEST EDITION.
2. PREFORMED THERMOPLASTIC PAVEMENT MARKINGS SHALL BE INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND IN ACCORDANCE WITH SECTION 634 OF THE LATEST EDITION OF "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" PUBLISHED BY THE STATE OF NEVADA, DEPARTMENT OF TRANSPORTATION (NDOT), EXCEPT ALL THERMOPLASTIC MARKINGS WILL BE 0.090 INCHES THICK, EXCEPT MARKING FOR BIKE LANES WHICH WILL BE 0.075 INCHES. HOT-APPLIED EXTRUDED THERMOPLASTIC SHALL NOT BE USED.
3. CROSSWALK MARKINGS SHALL BE INSTALLED AT ALL TRAFFIC SIGNAL LOCATIONS AND AT OTHER LOCATIONS AS DIRECTED BY ENGINEER.
4. PLACE 24" WIDE STOP BAR FOR SIGNALIZED CONTROL INTERSECTIONS. USE 12" WIDE STOP BAR FOR STOP CONTROL INTERSECTIONS. FOR YIELD CONDITION SEE YIELD MARKINGS ABOVE.



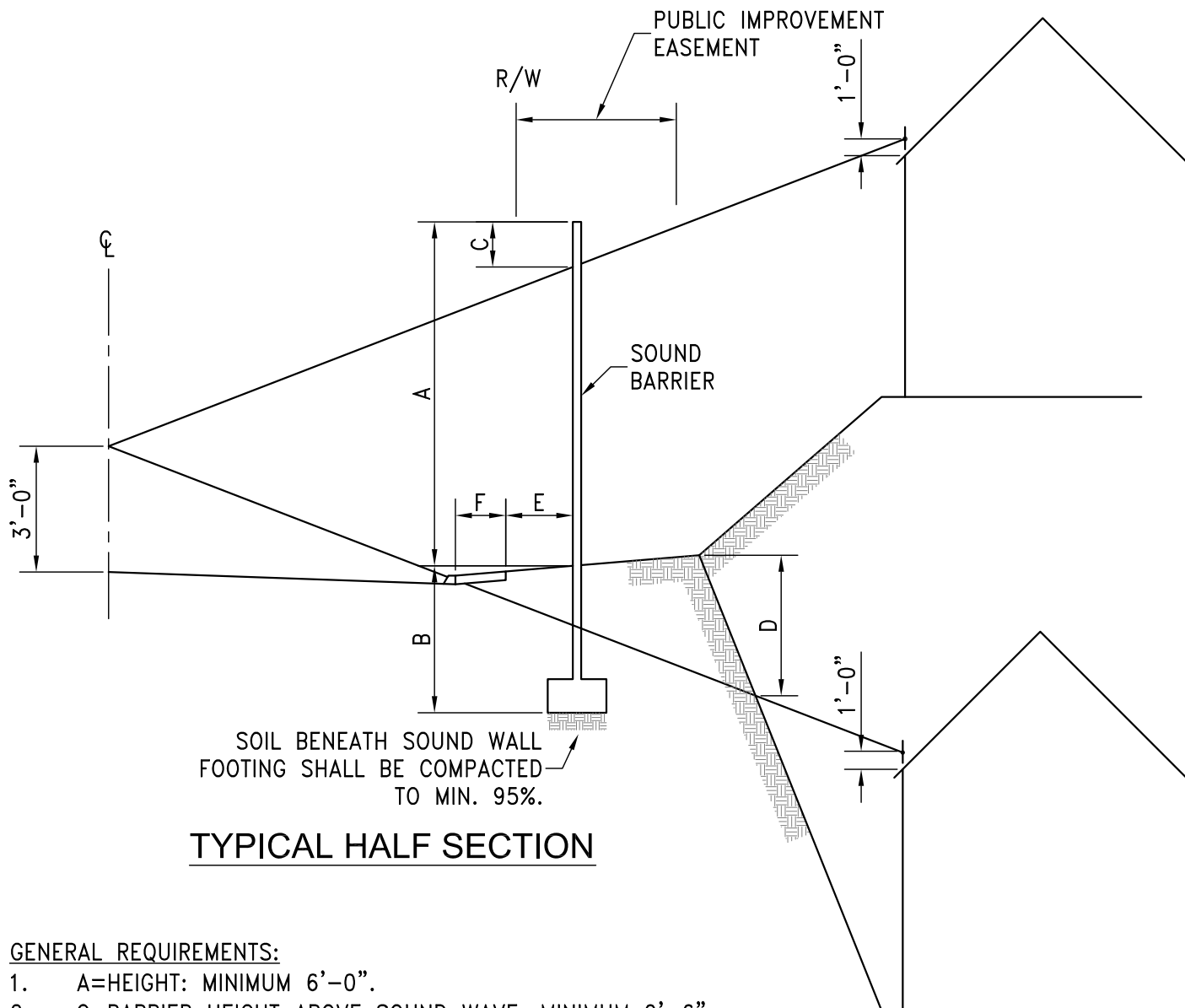
STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**CROSSWALK LEGEND**

**R-420**

APPROVED BY: JF | DATE: 1/2013



## TYPICAL HALF SECTION

### GENERAL REQUIREMENTS:

1. A=HEIGHT: MINIMUM 6'-0".
2. C=BARRIER HEIGHT ABOVE SOUND WAVE: MINIMUM 0'-6".
3. D=EARTH BERM: WHEN EARTH BERM EXCEEDS 2'-0" ABOVE SOUND WAVE, BARRIER IS NOT REQUIRED.
4. DRAINAGE COLLECTED FROM TWO OR MORE LOTS IS TO BE COLLECTED AND PIPED ALONG BACK OF BARRIER TO A STORM DRAIN SYSTEM.

### ADDITIONAL REQUIREMENTS:

5. B=DEPTH OF FOOTING BELOW GROUND: MINIMUM 2'-0".
6. E=LANDSCAPING STRIP: MINIMUM 4'-6".
7. F=SIDEWALK WIDTH: CONSTRUCT SIDEWALK FULL WIDTH BETWEEN BACK FACE OF CURB AND FACE OF WALL WHEN LANDSCAPING STRIP IS NOT REQUIRED: MINIMUM 5'-0".
8. THE CITY OF RENO'S PLANNING DEPARTMENT SHALL APPROVE THE COLORS AND TEXTURES ON THE FRONT FACE OF THE SOUND BARRIER.
9. BARRIER PLANS ARE TO BE STAMPED AND SIGNED BY A NEVADA REGISTERED CIVIL ENGINEER, VERIFYING TO THE INTEGRITY OF THE STRUCTURAL DESIGN.
10. BARRIERS WILL BE OWNED AND MAINTAINED BY THE CITY WHERE A HOMEOWNER'S ASSOCIATION DOES NOT EXIST.
11. LANDSCAPING ALONG FRONT FACE OF BARRIER WILL BE MAINTAINED BY THE CITY WHERE A HOMEOWNER'S ASSOCIATION DOES NOT EXIST.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

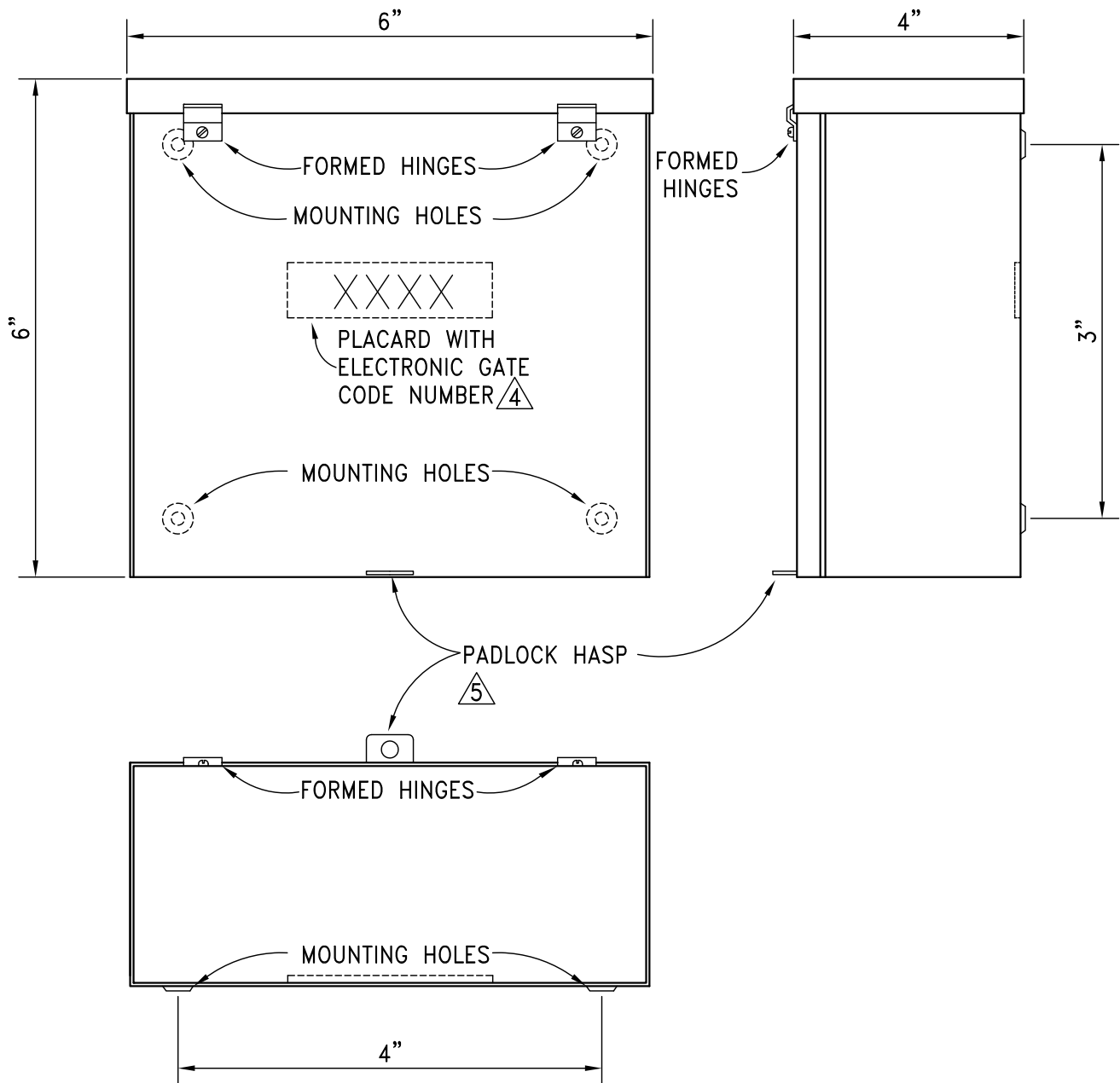
## SOUND BARRIER

DRAWING No.

R-501

APPROVED BY: JF

DATE: 1/2013



**NOTES:**

1. THIS BOX IS INTENDED FOR INSTALLATION AT GATED COMMUNITIES WITH ELECTRONICALLY CONTROLLED ACCESS GATES, WHERE ACCESS BY THE CITY OF RENO PERSONNEL IS REQUIRED.
2. THIS BOX IS TO BE INSTALLED ADJACENT TO THE VEHICLE ENTRANCE GATE, ACCESSIBLE BY PERSONNEL FROM THE OUTSIDE PERIMETER.
3. THE ELECTRONIC GATE ACCESS BOX IS TO BE A "B-LINE" TYPE 3R HINGE COVER ENCLOSURE, PART NO. 664 RTHC NK, OR APPROVED EQUIVALENT.
- △4. A PLACARD WITH THE CODE FOR THE ELECTRONIC VEHICLE SECURITY GATE IS TO BE MOUNTED INSIDE THE BOX.
- △5. THE CITY OF RENO IS TO PROVIDE THE PADLOCK AND MAINTAIN THE KEYS.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# **ELECTRONIC GATE ACCESS BOX**

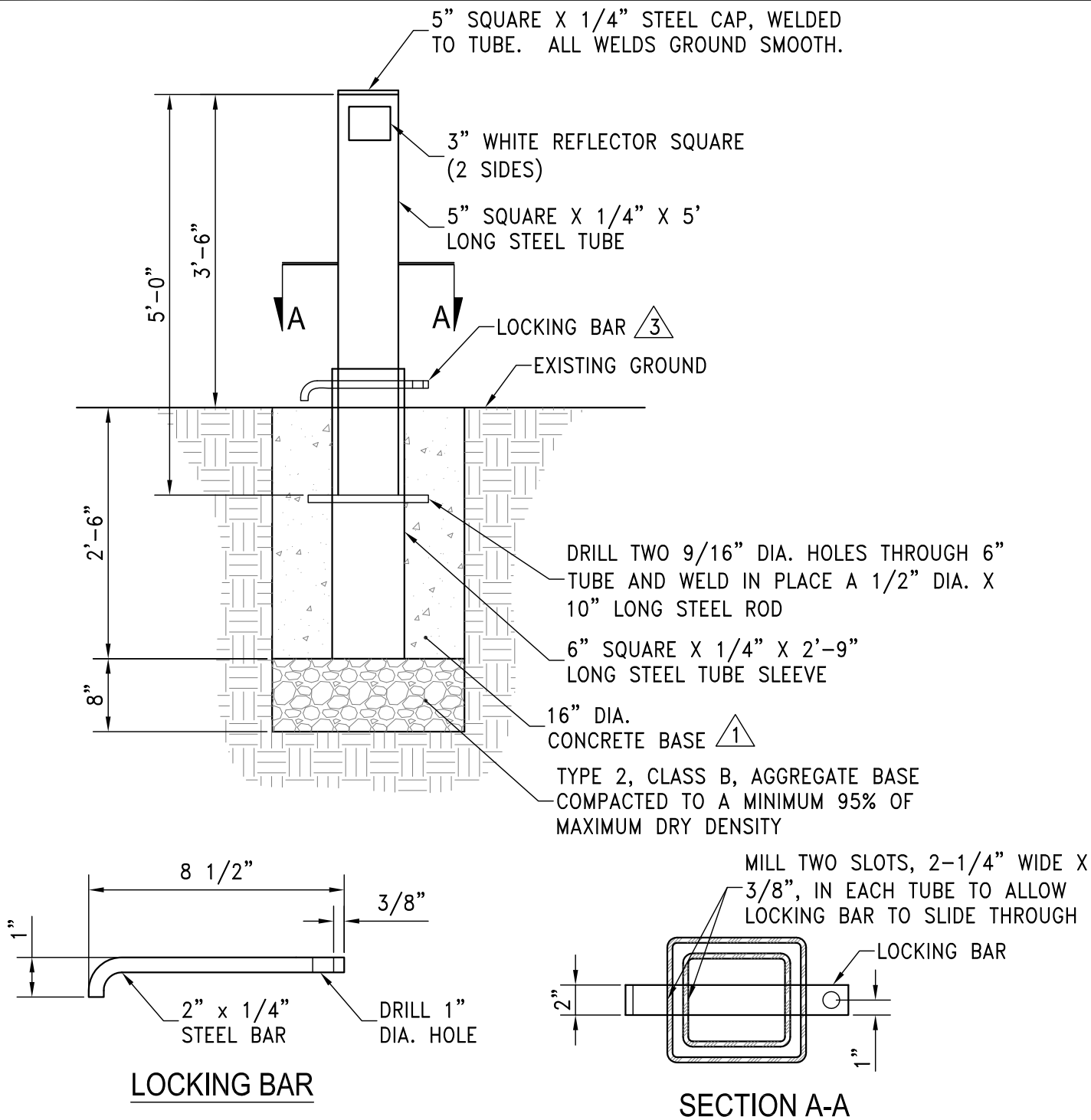
DRAWING No.

**R-502**

APPROVED BY: JF

DATE: 1/2013





NOTES:

- <sup>1</sup>. PORTLAND CEMENT CONCRETE (P.C.C.) SHALL HAVE THE FOLLOWING CHARACTERISTICS: 3000 PSI MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, MINIMUM 6 SACKS OF CEMENT PER CUBIC YARD WITH SLUMP AT 1 TO 4 INCHES. ALL MATERIAL SHALL CONFORM TO SSPWC, SECTION 202.
2. ALL WELDS AND BENDS SHALL BE SMOOTH, EVEN AND PAINTED.
- <sup>3</sup>. THE CITY OF RENO SHALL PROVIDE THE PADLOCK AND MAINTAIN THE KEYS.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

DRAWING No.

**REMOVABLE BOLLARD**

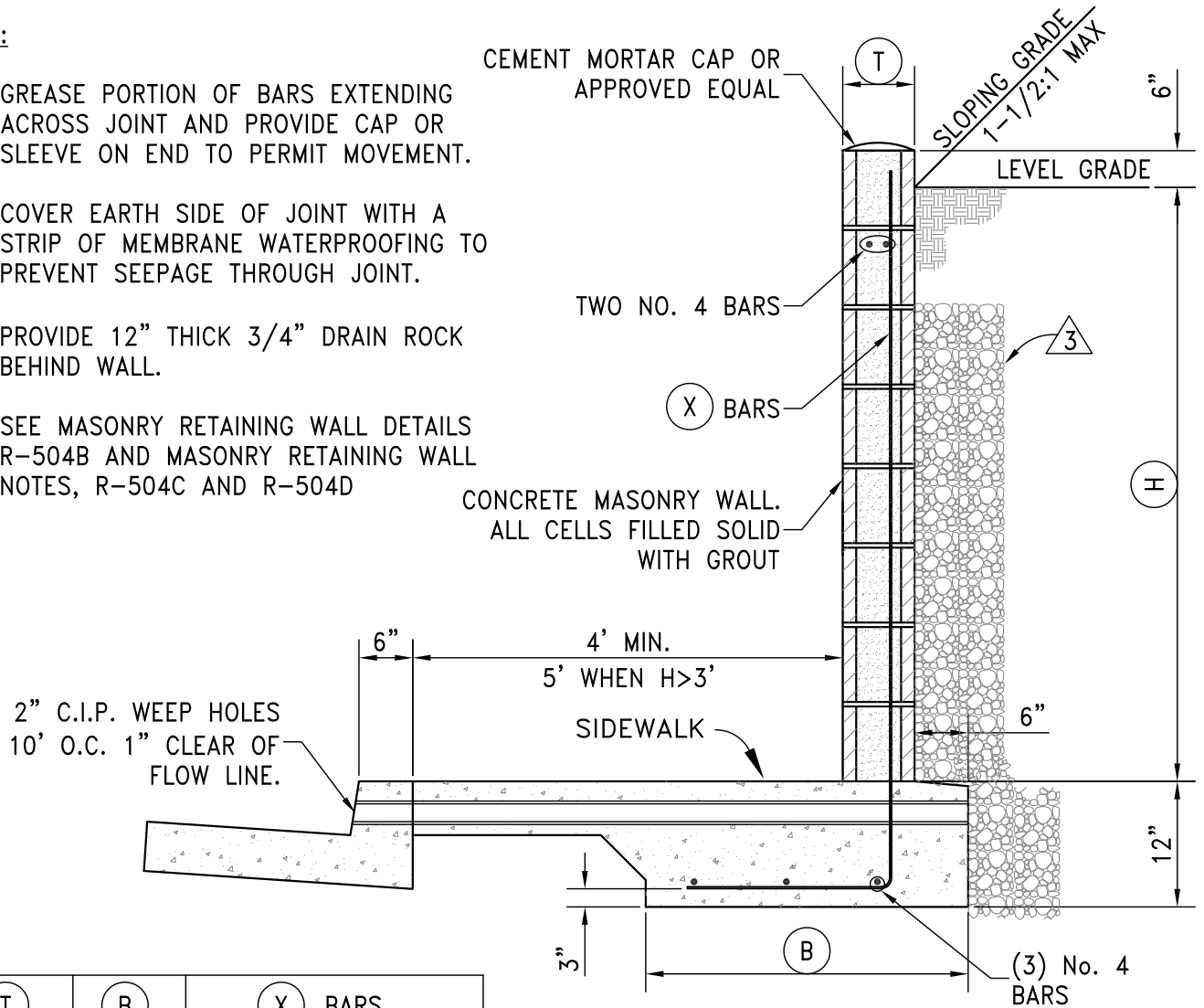
**R-503**

APPROVED BY: JF

DATE: 1/2013

# NOTES:

1. GREASE PORTION OF BARS EXTENDING ACROSS JOINT AND PROVIDE CAP OR SLEEVE ON END TO PERMIT MOVEMENT.
2. COVER EARTH SIDE OF JOINT WITH A STRIP OF MEMBRANE WATERPROOFING TO PREVENT SEEPAGE THROUGH JOINT.
3. PROVIDE 12" THICK 3/4" DRAIN ROCK BEHIND WALL.
4. SEE MASONRY RETAINING WALL DETAILS R-504B AND MASONRY RETAINING WALL NOTES, R-504C AND R-504D



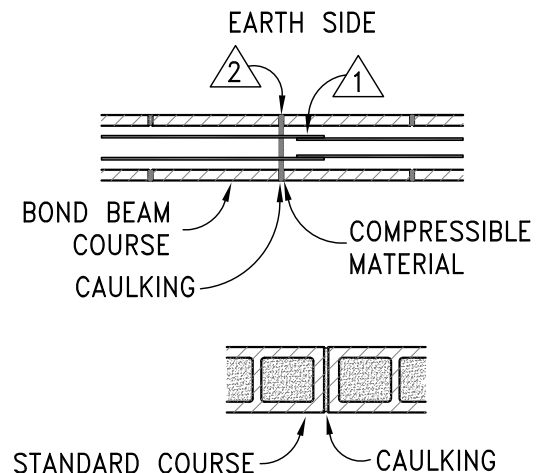
TYPICAL SECTION 5' MAX

(H)	(T)	(B)	(X) BARS
1	7 5/8"	1'-8"	No. 4 AT 24" O.C.
2	7 5/8"	1'-8"	No. 4 AT 24" O.C.
3	7 5/8"	2'-3"	No. 4 AT 24" O.C.
4	7 5/8"	3'-0"	No. 4 AT 24" O.C.
5	7 5/8"	3'-6"	No. 5 AT 16" O.C.

## SLOPING GRADE

(H)	(T)	(B)	(X) BARS
1	7 5/8"	1'-2"	No. 4 AT 32" O.C.
2	7 5/8"	1'-2"	No. 4 AT 32" O.C.
3	7 5/8"	1'-9"	No. 4 AT 32" O.C.
4	7 5/8"	2'-2"	No. 4 AT 32" O.C.
5	7 5/8"	2'-9"	No. 4 AT 24" O.C.

## LEVEL GRADE



TYPICAL EXPANSION JOINT DETAIL



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

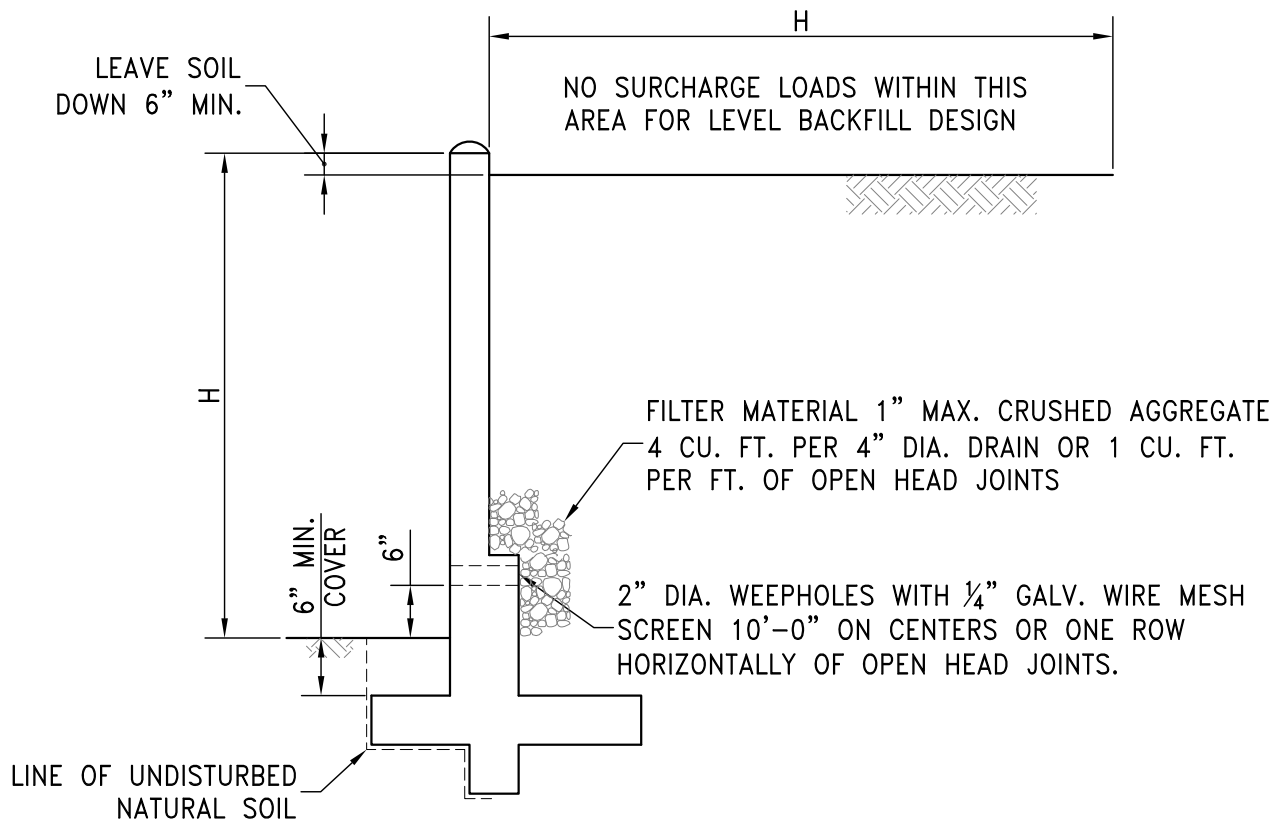
# MASONRY RETAINING WALLS I-L & S

DRAWING No.

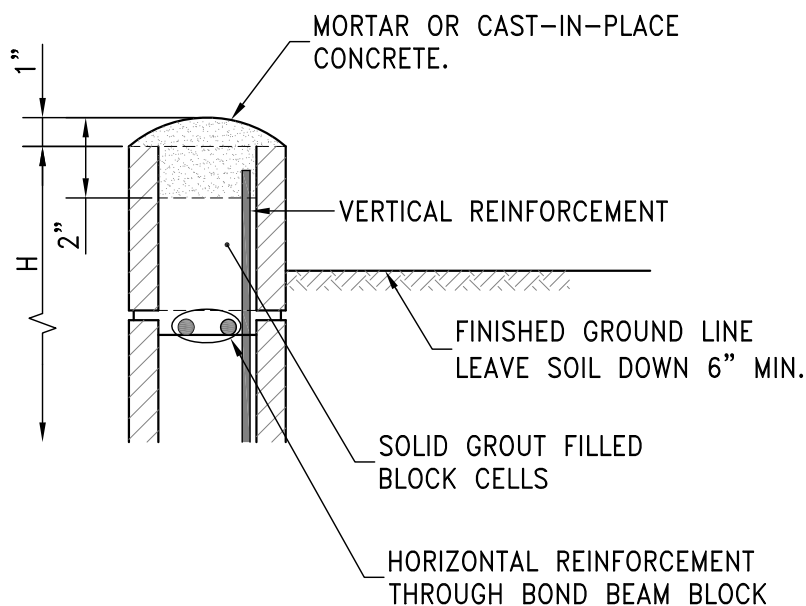
R-504A

APPROVED BY: JF

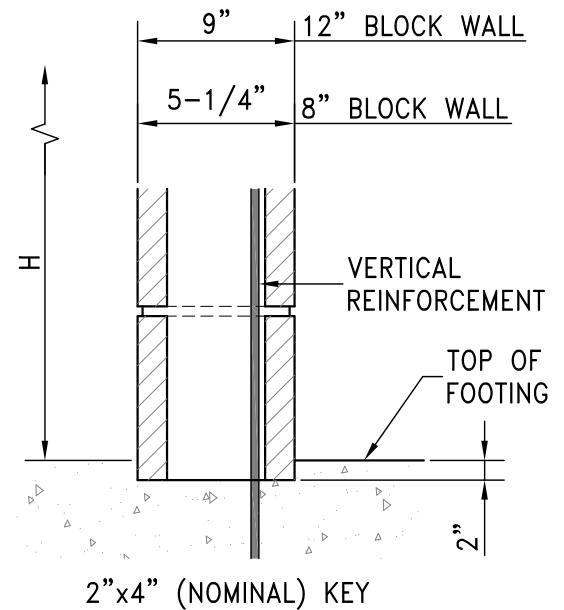
DATE: 1/2013



**TYPICAL SECTION**



**CAP DETAIL**



**KEY DETAIL**

NOTE:  
ALL MASONRY RETAINING WALLS SHALL BE CONSTRUCTED WITH CAP,  
KEY AND DRAINAGE DETAILS AS SHOWN HEREON.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

# MASONRY RETAINING WALLS

DRAWING No.

R-504B

APPROVED BY: JF DATE: 1/2013

1. WALL TYPES:

I-TOE SUPPORT  
II-HEEL SUPPORT  
III-TOE AND HEEL SUPPORT  
L-LEVEL BACKFILL  
S-SLOPING BACKFILL

2. DESIGN CONDITIONS:

WALLS ARE TO BE USED FOR THE LOADING CONDITIONS SHOWN FOR EACH TYPE WALL. DESIGN H SHALL NOT BE EXCEEDED. FOOTING KEY IS REQUIRED EXCEPT AS SHOWN OTHERWISE. SPECIAL FOOTING DESIGN IS REQUIRED WHERE FOUNDATION MATERIAL IS INCAPABLE OF SUPPORTING TOE PRESSURE LISTED IN TABLES.

3. REINFORCEMENT:

INTERMEDIATE GRADE, HARD GRADE OR RAIL STEEL DEFORMATION SHALL CONFORM TO ASTM A615, A616, A617. BARS SHALL LAP 40 DIAMETERS, WHERE SPLICED, UNLESS OTHERWISE SHOWN ON PLANS. BENDS SHALL CONFORM TO THE MANUAL OF STANDARD PRACTICE, A.C.I. BACKING FOR HOOKS IS FOUR BAR DIAMETERS. ALL BAR EMBEDMENTS ARE CLEAR DISTANCES TO OUTSIDE OF BARS. SPACING FOR PARALLEL BARS IS CENTER TO CENTER OF BARS. ALL REINFORCING SHALL BE 3" CLEAR UNLESS OTHERWISE SHOWN.

4. MASONRY:

ALL MASONRY SHALL CONFORM TO THE REQUIREMENTS OF SUB-SECTION 311.13 "MASONRY CONSTRUCTION" OF THE "STANDARD SPECIFICATIONS FOR PUBLIC CONSTRUCTION". ALL MASONRY SHALL CONFORM TO THE REGULATIONS OF THE U.B.C.

5. FOOTINGS:

BOTTOM OF FOOTINGS WILL BE PLACED AT LEAST 24" BELOW FINISHED GROUND SURFACE. CHANGES IN FOOTING ELEVATIONS SHALL BE MADE IN EQUAL INCREMENTS OF MASON BLOCK HEIGHT.

6. TESTING:

SUFFICIENT TESTING WILL BE CONDUCTED TO VERIFY DESIGN DATA.

7. DESIGN DATA:

EARTH = 120 PCF AND EQUIVALENT  
FLUID PRESSURE = 36 PSF PER  
FOOT OF HEIGHT

REINFORCED MASONRY:

$F'_m = 600$  PSI  
 $F_m = 200$  PSI  
 $F_s = 20,000$  PSI  
 $n = 50$

REINFORCED CONCRETE:

$F_c = 1,200$  PSI  
 $F'_c = 3,000$  PSI  
 $F_s = 20,000$  PSI  
 $n = 10$

WALLS SHOWN FOR 1 1/2:1 UNLIMITED SLOPING SURCHARGE ARE DESIGNED IN ACCORDANCE WITH RANKINE'S FORMULA FOR UNLIMITED SLOPING SURCHARGE WITH  $\phi=33^\circ 42'$ .



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

NOTES - MASONRY  
RETAINING WALLS

DRAWING No.

R-504C

APPROVED BY: JF | DATE: 1/2013

8. CONCRETE:

ALL CONCRETE SHALL BE CLASS AA OR DA.

9. MASONRY MORTAR:

THE MORTAR SHALL CONFORM TO THE REQUIREMENTS OF SUB-SECTION 311.13 "MASONRY CONSTRUCTION" OF THE "STANDARD SPECIFICATION FOR PUBLIC WORKS CONSTRUCTION". MORTAR IN HORIZONTAL JOINTS SHALL FULLY COVER ALL FACE SHELL AND WEB MEMBERS. VERTICAL JOINTS SHALL BE BUTTERED TO A DEPTH GREATER THAN THE THICKNESS OF THE FACE SHELLS OF THE BLOCK. FURROWING OF MORTAR WILL NOT BE PERMITTED.

10. GROUT:

THE GROUT SHALL CONFORM TO THE REQUIREMENTS OF SUB-SECTION 311.13 "MASONRY CONSTRUCTION" OF THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION". ALL CELLS SHALL BE POURED SOLID WITH GROUT.

11. EXCAVATION AND BACKFILL:

COMPACTION OF BACKFILL MATERIAL BY JETTING OR PONDING WITH WATER WILL NOT BE PERMITTED. EACH LAYER OF BACKFILL SHALL BE MOISTENED TO ITS OPTIMUM AND THOROUGHLY TAMPED, ROLLED OR OTHERWISE COMPACTED TO AT LEAST 90% OF ITS MAXIMUM DRY DENSITY. NO BACKFILL MATERIAL SHALL BE DEPOSITED AGAINST MASONRY RETAINING WALLS UNTIL THE GROUT HAS DEVELOPED A STRENGTH OF 2,000 POUNDS PER SQUARE INCH IN COMPRESSION AS DETERMINED BY TEST 2" CUBES, OR UNTIL THE MASONRY RETAINING WALL HAS CURED FOR A MINIMUM OF 14 DAYS.

12. OPTIONAL MORTAR KEY:

EMBEDMENT OF THE FIRST COURSE OF BLOCK IN A POURED FOOTING MAY BE OMITTED BY PROVIDING A MORTAR KEY. THE KEY IS FORMED BY EMBEDDING A FLAT 2 X 4 FLUSH WITH THE TOP OF THE FRESHLY POURED FOOTING. REMOVE THE 2 X 4 AFTER THE CONCRETE HAS STARTED TO HARDEN.

13. EXPANSION JOINTS:

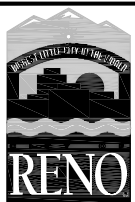
WALLS OVER 50 FEET IN LENGTH SHALL HAVE EXPANSION JOINTS AT 25' INTERVALS (SEE DETAILS).

14. WEEP HOLES:

WEEP HOLES SHALL BE INSTALLED AT 10' O.C. IN THE FIRST ROW OF BLOCKS ABOVE FINISHED GROUND SURFACE. BACKFACE OF WALL WILL BE WATERPROOFED.

15. INTERCEPTOR SWALES:

INTERCEPTOR SWALE TO BE CONSTRUCTED AT BACK OF WALL WHEN DIRECTED BY THE CITY ENGINEER.



STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION

**NOTES - MASONRY  
RETAINING WALLS**

DRAWING No.

**R-504D**

APPROVED BY: JF      DATE: 1/2013